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THE OFFICIAL MAGAZINE OF
THE DEPARTMENT OF THE ARMY

The mission of ARMY INFORMATION DIGEST is to keep personnel of the Army aware of trends and developments of professional concern.

The Digest is published under supervision of the Army Chief of Information to provide timely and authoritative information on policies, plans, operations, and technical developments of the Department of the Army to the Active Army, Army National Guard, and Army Reserve. It also serves as a vehicle for timely expression of the views of the Secretary of the Army and the Chief of Staff and assists in the achievement of information objectives of the Army.

Manuscripts on subjects of general interest to Army personnel are invited.

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COVER. Partisans of freedom speak a universal language as Army special forces — skilled in self-defense, communications, medical aid — help train local guerrillas to fight an enemy with his own tactics behind the lines, as described in this issue.

COMMAND LINE

Army Views On Vital Issues

ON ARMY AVIATION NEEDS

"We must remember that, to the Army, flying is not an end in itself, nor is it competitive with the aviation of any other Service. Even as we move more and more into the first few hundred feet above the actual surface of the earth, our mission remains: '. . . prompt and sustained combat incident to operations on land.' I think the term 'flying soldiers,' which encompasses not only our aviators but also the commanders and troops who fly with them, indicates the framework in which Army Aviation must grow, and it is expressive of the philosophy of an Army which must move through the air to an ever-increasing degree if it is to accomplish its mission.

"With this in mind, we are asking for aircraft that are simpler to maintain, with greater capacities, better performance and a far greater ability to land and take off from very small, unimproved areas anywhere on earth. We require a much better capability to operate our aircraft under conditions of severely restricted visibility or in the dark of night. We must have air vehicles which are able successfully to defend themselves by one means or another against hostile fire. We are asking a great deal, but we have every confidence that industry can and will meet the challenge."

Secretary of the Army Elvis J. Stahr, jr., at AUSA Army Aviation Symposium, Fort Rucker, Alabama, 23 March 1961.

ON RESEARCH AND MOBILITY

"Our military power today, in terms of firepower, is truly formidable. In communications —the *sine qua non* of command and control—we have leaped ahead. But the Army has one crying need today, and that is for revolutionary strides in the third vital area—mobility. We must break the ground-bound barrier!

"In mobility, imagination and engineering have outstripped existing materials and surpassed the state-of-the-art in power sources. I forecast that through new advances in the science of materials research we can cut through conventional barriers and attain the truly revolutionary improvement we require in mobility. Our progress here is dependent on the solution of crucial materials and energy problems."

Lt. Gen. Arthur G. Trudeau, Chief of Army Research and Development, before Armed Forces Communications and Electronics Association, Fort Monmouth, N.J.

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On the front lines of freedom—

SPECIAL FORCES:

Training for Peace and War

Lieutenant General Barksdale Hamlett

THE MOTTO *"De Oppresso Liber"* —To Liberate from Oppression— which shines from the distinctive insignia of the United States special forces soldier furnishes hope for oppressed people throughout the world that they may one day enjoy freedom.

Much has been written of the United States Army Special Forces and their mission of infiltrating deep behind enemy lines in the event of war. Little, however, has been written of the role of special forces during the period which has been referred to as the fusion of peace and war.

As with other Army forces, the training of special forces is one of the Army's most important missions today, and Man is the essential element. The aspirants for special forces must be volunteers. In addition, they must be imbued with the same spirit that caused their forefathers to join such famous organizations as Rogers' Rangers, Merrill's Marauders, and many others. They must possess a willingness to suffer hardships, make sacrifices, and to work under difficult conditions. (See "This Is Special Warfare—U.S. Army Style," June 1960 DIGEST.)

Surprisingly to the Communists, who have made claims that we are decadent, many of our citizens from the farms, factories, and offices of America are now proving the fallacy of such claims and are responding to the Army's need for individuals who will undergo personal sacrifice to help protect our Free World institutions.

Creating Combat Experts

AFTER completing basic training, special forces volunteers join the 7th Special Forces Group (Airborne) at Fort Bragg, North Carolina, and commence specialized training designed to make them potent, highly skilled, and tough members of a twelve-man operational detachment, the basic

element of the special forces group.

This basic operational detachment consists of two officers and ten enlisted men. The two officers and two senior NCO's provide the control, intelligence, and operational skills required for efficient functioning of the team. The other eight enlisted men must acquire proficiency in other important fields. Two members of the team are trained in each of the following skills—weapons, demolitions, communications, and medicine.

Weapons experts must be versed in the operation and minor maintenance of all U.S. Army weapons that might be used by friendly guerrilla forces. In order to take advantage of foreign arms that may be seized by guerrilla groups, the weapons specialists must also be familiar with a wide range of foreign arms—pistols, rifles, machine guns, mortars, and many others. Since even these arms may be lacking, the guerrillas may have to be trained to fabricate "zip" guns, bows and arrows, and other weapons.

The demolitions specialists become adept in the use of explosives for sabotage and delaying operations. They must be familiar with simple demolitions ranging from setting booby traps and destroying bridges and rail lines to the more complex task of blocking major passes to enemy forces by the planned use of sophisticated demolition techniques. The demolition specialists must be resourceful in improvising small and ingenious devices from materials found in the area. It would not be unusual for these soldiers to make explosives from fertilizer and a few chemicals.

The medical specialists must be familiar with the diseases endemic to the area of operation and the treatment necessary to insure that the team will remain healthy and operational. They must be able to perform emergency battlefield surgery and care for the wounded in isolated areas until evacuation by aircraft or helicopters is possible, or until the wounded can receive medical aid from doctors supporting the guerrilla movement.

In order to receive instructions from the special forces base and command elements and to provide communications with other special forces elements and guerrilla commands, two communicators are needed in the operational team. These soldiers must be qualified as intermediate speed radio operators of the detachment's special lightweight radio for transmitting coded messages concerning re-supply, ambushes, and similar actions.

Survival Skills

THE skills of the special forces detachment are further refined through instruction at specialist schools. Medical special forces soldiers, for example, receive six months of training at Brooke Army Medical Center to gain the necessary skills as surgical technicians. If they belong to the special forces group at Fort Bragg,

Lieutenant General Barksdale Hamlett
Deputy Chief of Staff for Military Operations, Department of the Army

Detailed plans are drawn up to insure success of an ambush in counter-guerrilla operations by special forces.

they receive on-the-job training under experienced surgeons at Womack Army Hospital. Here they gain the ability to perform minor surgical operations under field conditions with limited, essential medical equipment.

Besides training in leadership and in individual primary skills, the special forces soldiers are cross-trained in the other three skills to insure continuity of operations if a team member is lost, or in the event of widely dispersed operations. Each member of the team must be able to send and receive Morse Code; each must know basic demolition techniques. Each man must be able to establish the necessary sanitation measures for a guerrilla assembly area, must be prepared to teach the rudiments of weapons and self-defense to the guerrilla force.

In addition to technical training, special forces soldiers also undergo survival training. They must be able to survive in remote areas—if necessary on food that is available from the land—and to operate under difficult terrain and climatic conditions. They become airborne qualified, if they have not already done so, in order to jump into areas where guerrilla groups may be formed. They are sent to the Jungle Warfare Training Center, operated under United States Army, Caribbean, where they learn to operate and survive in jungle areas. (See "The Jungle: Neutral Adversary," May 1961 DIGEST.) The team also is trained in amphibious, arctic, mountain, and desert operations.

Training—Joint, Combined, Allied

MUCH of the advanced training is provided by members of the other services. The special forces team acquires experience in moving ashore at night from a submarine into an enemy-held coastal area. Navy underwater demolition personnel teach techniques of destroying underwater obstacles. The Air Force is a partner in improving the team's ability to jump from high-speed aircraft at low altitudes to evade counter-action.

In addition to this joint training, special forces teams are engaged today in combined training with allied military forces throughout the globe. Annually, teams of the 1st Special Forces Group (Airborne) on Okinawa participate in exercises with their special forces counterparts in the area. In Europe, the 10th Special Forces Group (Airborne) engages in similar maneuvers with United States

Air Force and Naval commands and other NATO forces. Through such exercises, combined operational tactics and techniques are refined for the day that they may be required.

Readiness for Action

TO PREPARE themselves for organizing guerrilla movements in other countries and for training foreign forces in U.S. Army tactics and techniques of special forces operations, all members of the team must participate in detailed area and language study. They must absorb information, for example, on the attitudes, customs, politics, and economic conditions of specific countries which may be the scene of future operations.

As many members of the team as possible are given language training at the Army Language School, and maintain their proficiency through further instruction and practice at their home stations. Special forces teams have linguists qualified in most of the known languages of the world today. Emphasis is now being placed on developing a language fluency in many of the dialects or languages found in remote areas which may have future operational significance.

As the special forces team members must be able to communicate in the language of the guerrillas to accomplish their basic mission, so also must these American soldiers be able to communicate with other segments of the population in order to gain their material and moral support. Trained in psychological operations, the team can assist in the preparation of leaflets and other material designed to gain the support and active cooperation of foreign peoples in impeding the efforts of the enemy.

Although all of this preparation is directed toward the team's employment in operational areas in the event of war, the training has produced two important capabilities to meet the requirements of the Cold War in which the United States is now engaged.

First, in order to operate with and advise guerrilla groups and to prevent their destruction or capture, these teams must, of necessity, master the tactics and techniques of counter-guerrilla forces.

Second, in order to develop instructors for expansion within guerrilla movements, special forces teams should be able to communicate with and teach such individuals in a short period of time how to shoot the weapons that are available, how to execute sabotage missions, and how to establish intelligence nets without which the force could neither function nor survive.

Assisting Our Allies

TODAY these by-products of special forces training are of value to many Free World nations emerging from colonial status who find themselves faced with the threat of Communist-sponsored insurgency and subversion. Many such states have requested military assistance from the United States to counter this threat and to establish a base of stability through which political, economic,

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" . . . IN MOST AREAS of the world, the main burden of local defense against overt attack, subversion, and guerrilla warfare must rest on local populations and forces. But given the great likelihood and seriousness of this threat, we must be prepared to make a substantial contribution in the form of strong, highly mobile forces trained in this type of warfare, some of which must be deployed in forward areas, with a substantial airlift and sealift capacity and prestocked overseas bases . . . "

PRESIDENT JOHN F. KENNEDY
in Budget Message to the
Eighty-Seventh Congress,
28 March 1961

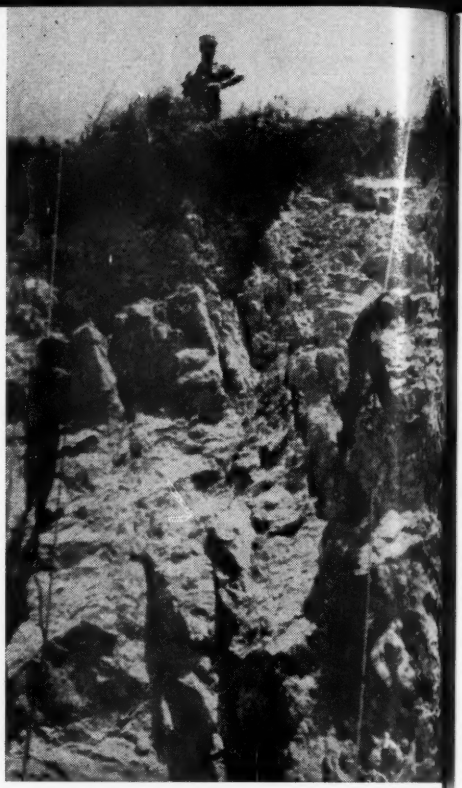
Specialists in U. S. Army weapons learn how to instruct a guerrilla group in handling combat items.

and social programs for the well-being of their peoples may be established. Part of the military assistance from the United States includes the deployment of special forces teams to certain of these countries.

Upon arrival in the country concerned, the team realizes that their rigorous and detailed preparation has paid off. Some teams find that basic training of foreign personnel in marksmanship, field sanitation, first

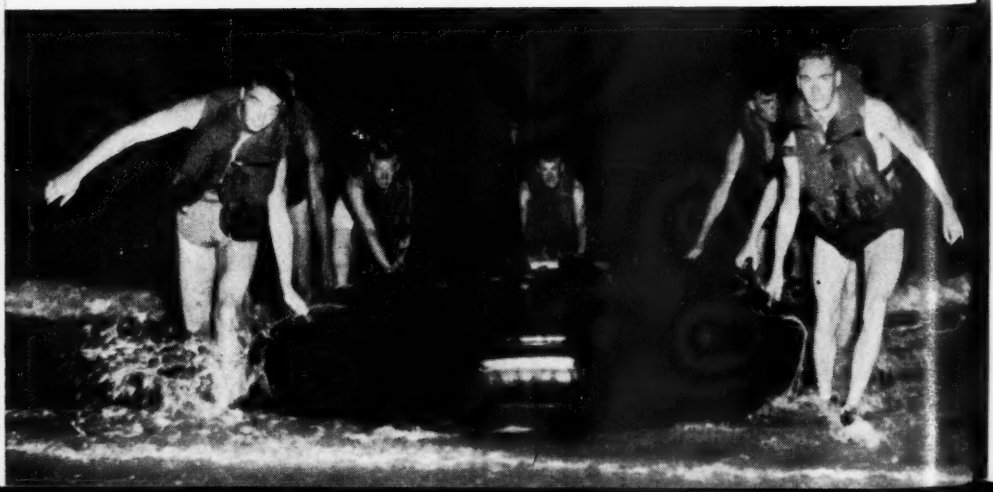
The weapons specialist must be familiar with a wide variety of foreign arms, ranging from small arms to mortars, that may be seized in an actual operation.

Special forces troops cut their way through jungle growth . . .



. . . or clamber up rock ledges as they train to overcome difficult terrain.

Communications must be maintained, left, while below men practice night landings from submarine as part of raid technique.



aid, and scouting and patrolling is required before they can begin the tactical training to combat guerrillas. The instruction then advances to small unit counter-guerrilla tactics and techniques, particularly for key personnel who will establish additional training programs.

While supervising the counter-guerrilla instruction programs conducted by foreign military personnel, the team is available to assist and advise the foreign army commanders and staffs in specific tactics and techniques to be employed in reducing Communist guerrilla activity and eliminating it eventually from the country. Today these advisory missions are paying off slowly and surely through the actions of men who have learned from special forces how to fight an enemy with his own tactics.

Special forces advisory teams also have become "good-will ambassadors" of the United States. They have won many friends because they speak or are familiar with the language of the host country, because they understand the life and customs of the inhabitants, and are willing to help others less fortunate than they. Special forces medical technicians, with typical American concern, have assisted sick or injured children and adults until further medical care could be obtained. In some cases, the team technicians have been the only personnel qualified in basic medicine in the entire countryside; their skills have been of inestimable value to small, isolated communities.

From their training in time of peace and utilization of this training during the Cold War, the special forces units also are preparing for their wartime mission, should the need arise. *They are learning now how to train and to live with the forces of foreign countries who will be our allies should war occur.*

From this experience in the field, operating with foreign forces against unconventional and vicious elements that pose a threat to freedom, they are encountering problems, in peace as they will in war, that require solution by men with strong hearts, mature judgment, and the determination that freedom from oppression can and will be achieved by free men everywhere.

A demolition crew is guarded by other team members as they practice blowing up a railroad line far in enemy rear.

Code of Conduct—
The Soldier-Patriot's
Antidote to

Colonel John O. Weaver

WITH lapse of a decade since the height of the Korean War, it is now possible to place in perspective and examine objectively one phase of that war which caused a furore and created new problems in Army leadership—the so-called "brain washing" of U. S. and Allied troops in Communist prison camps.

It also is possible now to assess the lessons of this phase of the war both from a military and civilian viewpoint, and to assess the value of military countermeasures, their practicality in day-to-day Army training, and their probable efficacy if ever again Americans face an enemy that may employ the same tactics.

The American public was shocked and dismayed by first reports of this form of ideological warfare as practiced by the Chinese Communists. Then and even now, large segments of the public apparently labor under many misconceptions about this tactic. These have been caused by the stories concerning reaction of U.S. prisoners who were subjected to the pressures exerted by their captors, compounded by a lack of understanding as to just what did occur.

COLONEL JOHN O. WEAVER, Quartermaster Corps, is Special Assistant to the Chief of Information, Department of the Army.

Reports were circulated that as many as one in seven American prisoners collaborated with the enemy, betrayed their buddies, signed self-incriminating statements, or statements that incriminated their Government (despite the fact that those who did sign them knew nothing about the facts) and in general let their Nation down.

Now, however, from well over a hundred separate and scientific studies of prisoner behavior in those camps, it can be definitely stated that our men in Korean prison camps behaved as well as military men have acted in any war in which we have ever been engaged—despite the fact that they were subjected to treatment never experienced in any other war.

The facts are that a total of 7,158 Americans were taken prisoner. Over 90 percent of this number were taken during the first twelve months of the conflict, and most of them remained captives for nearly three years.

Imprisonment of such duration, under heavy pressures, places tremendous stress on any human being. Yet after repatriation, only 425 cases —about *six percent* of the total prisoner population—could even be suspected of any misbehavior. After these cases were thoroughly sifted and studied, only *14 individuals* warrant-

Brainwashing

ed court-martial action. Of these eleven were convicted.

With these cold facts to moderate the near-hysterical attitudes which at first surrounded the entire subject, we can now consider objectively how effective the so-called brainwashing was, examine how it worked, and look into the efficacy of countermeasures.

Manipulating Men's Minds

IN the first place, Americans were not subjected to actual brainwashing, although this term has struck a popular response because it is dramatically descriptive and is a handy catchphrase. Brainwashing is an effort or process whereby a man is completely broken in mind, body and spirit to

the point where he is controllable, much the same as an animated robot might be.

What was experienced in the prison camps was perhaps less directly brutal, but was just about as insidious in its effects and even more subtle because it was not so direct and observable as actual brainwashing. Actually it was a mass effort to render large numbers of individuals more tractable, unable or unwilling to resist, incapable of organized social behavior, while they still remained rational individuals. This technique was "mass manipulation" rather than brainwashing.

A STUDY of this technique presents a close-up picture of the way in which the Communists have worked over the years to bend the wills of large numbers of men everywhere in their avowed intent to control the world. It demonstrates how a minority can take over and dominate a majority. If it proves impossible to convince or convert the majority, then the masses are so neutralized that a few leaders can control them. All together, it presents a capsule picture of how the Communists have moved in to control large populations in satellite countries.

In some ways, evoking of this pressure pattern by the Communists on prisoners of war may prove to be, in the long run, a favor to the Free World. The public has now available a knowledge of how these techniques are practiced—even though there may still be many misunderstandings concerning them—which otherwise might never have been so dramatically impressed on the Free World.

Certainly, from a military standpoint, the lessons gained through the numerous studies are most valuable. For once we understand the elements of this manipulative process, we can contrive a defense. And if we find that the entire process is a good weapon, we can usually manage to build a better American weapon.

Troop Information Measures

IN considering counter-measures, the Army perhaps has given more attention to the matter than its sister services, largely because it is usually the ground soldier who must meet the enemy face to face in personal, rather than distant electronic combat. Thus, at least the basic machinery for combatting pressure manipulations was already established in the Army's Troop Information Program.

From the day he enters the Army until he leaves, the substance of the mass manipulation process, its techniques, methods, objectives and purposes, are never out of the soldier's sight or hearing. Formal lectures, informal talks, radio and television, pamphlets, brochures, posters, bulletin boards, film strips and slides, movies, unit and area newspapers, books and magazines—every method of communications is used to tell the soldier how to defend himself against this insidious form of ideological warfare.

Heart of the entire program is the six-point Code of Conduct, which gives the soldier the main points to remember in combatting the technique if he should be taken prisoner. Obviously neither the Code nor all the indoctrination and education in the world can substitute for moral integrity, deep religious feelings, and the realization that the American way of life is superior to the Communist —but they can and do help to strengthen these convictions and often give substance to the earlier training of the young soldier.

Unfortunately, the Code of Conduct is not too well understood, even in the services; for like many profound precepts it appears too simple. Also, its six points are sometimes not clearly related in the mind of the soldier to the techniques of manipulation and pressures. A consideration of these techniques and the relation of the Code thereto will help in creating a better understanding.

CONSIDER, then, just how these pressure techniques were applied, what was intended to be accomplished, and what the Code does to combat them.

Studies show that the mass manipulation process should not be considered solely in terms of individual degradation and torture, although these were certainly applied to many individuals along the way. Rather the process is a highly developed one of "education and indoctrination" which made use of some relatively simple findings of psychology and psychiatry. Nobody was driven out of his mind. The process did not and does not produce the simple alternative between dying and accepting the suggestions or demands of the captors.

In its essence, the techniques employed in Korea consisted of several steps or processes, each of which was practiced with ramifications and variations, and each of which could be—and often were—mingled or applied simultaneously. It may be said that these were used as "injections" of poison to the mind and will, and that the Code of Conduct offers antidotes to these poisons.

Consider the specific steps practiced by the Communists in relation to the various sections or points of the Code. It then will be possible to understand how the Code may serve as an effective antidote.

In essence, the technique of mass manipulation practiced by the Communists consisted of five main steps —Isolate, Confuse, Terrorize, Accuse, and finally Exhaust.

IT should be noted that, as a unit, the Code contains in its first three sections the essence of a general antidote to poisons used against prisoners of war. (*See box*) In the first place—don't get captured, or at least don't surrender while there is any possible means of resistance. However, if overcome by superior force, "I will continue to resist by all means available. I will make every effort to

THE CODE OF CONDUCT

I I am an American fighting man. I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense.

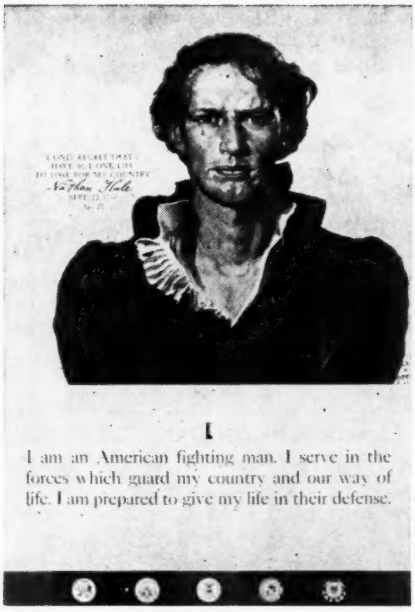
II I will never surrender of my own free will. If in command I will never surrender my men while they still have the means to resist.

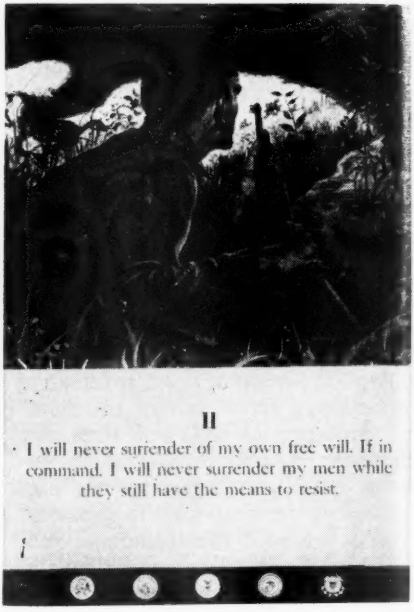
III If I am captured I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.

IV If I become a prisoner of war, I will keep faith with my fellow prisoners. I will give no information nor take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way.

V When questioned, should I become a prisoner of war, I am bound to give only name, rank, service number, and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country and its allies or harmful to their cause.

VI I will never forget that I am an American fighting man, responsible for my actions, and dedicated to the principles which made my country free. I will trust in my God and in the United States of America.


I
I am an American fighting man. I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense.


II
I will never surrender of my own free will. If in command, I will never surrender my men while they still have the means to resist.

escape and aid others to escape. I will accept neither parole nor special favors from the enemy."

All organized armies recognize that while a man may be a prisoner, he is still a soldier. He has an obligation to continue to help his nation in any way possible, even though he may be in a foul prison camp in a strange land.

In considering the elements of mass manipulation practiced by the Communists in Korea, the elements of the counter-measures or antidotes inherent in the Code become apparent.

Isolate

THE POISON—ISOLATE. Isolation was accomplished physically by separating leaders from men, but mental isolation was more important. Every effort was made to make each man feel alone by fomenting distrust of fellow prisoners in his unit and his camp. This was done by several methods.

Repatriated prisoners stated there appeared to be an informer in every squad room; but nobody ever was sure who it was, so everybody was mistrusted.

The technique of "self-criticism," another form of psychological informing, was widely practiced. Usually this was an apparently benign procedure. A man was confronted at camp headquarters by a quiet, English-speaking guard who stated that the prisoner had been informed on for, say, taking "more than your share of food at a meal."

No punishment was handed out; the prisoner was merely admonished not to do "anything destructive to the welfare of his group" in the future. Thus, after being made to feel guilty of some vague wrong, he would be asked to write an "essay" admitting this wrong, and stating why it was wrong to "steal" the food and not to share it.

Another technique was to control mail. Notices of overdue bills, Dear John letters, or those asking for a divorce or containing other bad news, were delivered. Letters containing

III

If I am captured I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.

IV

If I become a prisoner of war, I will keep faith with my fellow prisoners. I will give no information nor take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way.

any form of news that might hearten and strengthen the individual were not delivered.

Through these and other methods, the prisoner—tired, weary, harassed, humiliated by psychological exposure and feeling terribly alone—was left with nothing in his heart or mind but a yawning psychological void.

The enemy also used the isolation "poison" to break down any command structure in the prison compounds. Leaders were physically isolated and every attempt was made to isolate those who through natural abilities tended to assume command —either physically or by creating a distrust of them in the minds of their comrades.

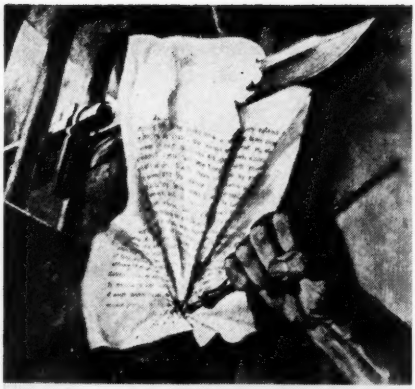
THE ANTIDOTE—". . . *I will keep faith with my fellow prisoners. I will give no information nor take any part in any action which might be harmful to my comrades.*"

Since the main aim of the isolation "poison" was to foment a deep-seated distrust of everybody on the part of the individual soldier, keeping faith with fellow prisoners and refusing to give any information will negate these attempts. Informing or any other action that may be detrimental in any way to a fellow prisoner is itself despicable. Identifying a fellow prisoner who may have some particularly valuable knowledge can, of course, subject that individual to extra pressures, which may even entail physical coercion.

Studies in this field have determined that if unwillingness to give information is strongly instilled in soldiers before capture, it can continue to enable them to resist even very strong pressures.

"If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way.

As has been seen, part of the isolation "poison" aims at breaking down discipline in prison camps. Such a breakdown means that personal hygiene, camp sanitation and care of the sick are neglected. The Code calls for any officer or noncommissioned



V

When questioned, should I become a prisoner of war, I am bound to give only name, rank, service number and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country and its allies or harmful to their cause.

VI

I will never forget that I am an American fighting man, responsible for my actions, and dedicated to the principles which made my country free. I will trust in my God and in the United States of America.

officer, regardless of branch or service, to assume responsibility. It must be emphasized that the legal responsibility for obeying lawful orders of a superior is not changed in the slightest because of captivity.

Confuse

THE POISON—CONFUSE. Into the mental and even physical void created by isolation, the Communists introduced an "educational" device — a series of lectures followed by discussion groups, written exercises or dramatic presentations of the points they desired to make. These, of course, were aimed at confusing the prisoners. Discussions centered on such topics as the "high injustices" of capitalism, the "evils of child labor in American factories or mines," or how "company script" never quite pays the bills at the company store.

Men were asked to take part in these discussions or even to act in skits. With no other activity available, and already feeling isolated, such actions fulfilled a human need. In very few instances can any thought of actual collaboration be demonstrated. The main aim of this technique was to break down, or at least weaken, the belief and faith in the American way of life and indeed in the very Government of the United States.

Creating confusion in the minds of the prisoners was a means of leading them into informing on others, into self-accusation and eventually signing statements accusing others. The lure of special favors for participating in discussions or skits was a strong one.

THE ANTIDOTE—*"I will accept neither parole nor special favors from the enemy. I will never forget that I . . . am responsible for my actions, and dedicated to the principles which made my country free."*

Attempts to confuse large numbers of individuals and to fill their minds with doubts concerning their own way of life, religious beliefs, and their country's aims, can scarcely succeed if the individuals have sufficiently

strong grounding in principles to withstand attack. It is equally obvious that the poison of sowing confusion will work more readily among those who lack strong background training and beliefs.

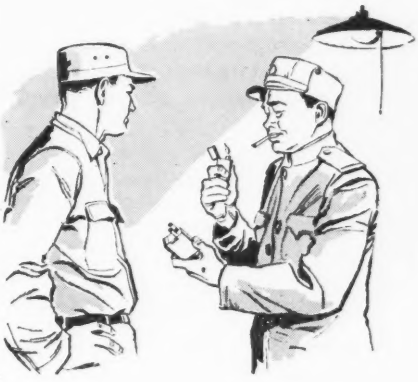
The technique of sowing confusion is old and has frequently been used in the battle to sway men's minds. One may recall that it was practiced in the Biblical account of Satan tempting Christ following the 40-day fast in the desert. As Christ was able to confound his confuser with terse quotations, so the Code provides statements of sound principles to counter the mass manipulation technique.

If the soldier who is under pressure can withstand the temptations to accept favors—or even to act in the hope of any favors from his captors—he will nullify attempts at confusing or sowing doubts in his own mind. And then, if he can remember that even though he may feel alone, even though he is a prisoner in a far-off, alien land, his actions still will be judged and that he must always be responsible for the results of every action—he will have applied the antidote to this particular bit of poison.

Terrorize

THE POISON—TERRORIZE. Terror or fear was widely used to promote isolation and also to add to mental and moral confusion; it also was a device to lead into the accusation phase of breaking down the individual will. Actually very few cases of physical violence could be substantiated by investigations following repatriation. But the constant threat of violence and force, especially when based on some instances in which they were used, was always difficult to withstand. To a confused and lonely soul, apparently lacking friends, bereft of leadership, poorly fed and often ill, the threat of violence or torture could be terrifying.

All this was combined with extremely contradictory actions on the part of the captors. What pleased them one day would infuriate them the next day, or even a few minutes later. Men found that their interrogators could not be pleased or humored. The man who might answer



anything he thought the interrogator wanted to hear would be startled and confused when the captor showed anger at the answer.

This is a basic psychological method used in laboratory situations to produce nervous breakdowns—only this time, instead of white mice, the subjects were human beings.

THE ANTIDOTE—*"I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense. . . . I will continue to resist by all means available."*

The individual who remembers that his duties as a soldier do not end if he has the misfortune to be taken a prisoner—that he is expected to perform in a prison camp exactly as though he were on a battlefield and that his actions always will be judged later—finds that terroristic methods actually steel him against the tactics of his captors.

Those in Korea who did so steel

themselves almost always found that threats of violence and other methods of inspiring fear were not actually implemented.

From Korean experiences it is possible to draw the conclusion that physical violence and torture as a mass measure are impractical since they are more concrete and easily observable than more insidious practices, and may very well lead to open revolt by large numbers of individuals. Experiences from prison revolts

among the civilian population show that desperate men may erupt into open violence—which was exactly the opposite of what the Communists were trying to accomplish by their mass manipulation pressure techniques. Even further, use of actual physical violence and torture may well create an unfavorable reaction on the part of world opinion.

To the individual faced with threats, all of this appears to be very cold comfort, but by constantly reminding himself of his duties as a soldier, he steels his will to withstand them.

Accuse

THE POISON—ACCUSE. Far from accusing the prisoner of any specified misdeed in order to isolate, confuse and terrorize him, this technique took a most insidious form. It consisted of having the prisoner accuse himself, his service or his Government of something heinous and then signing affidavits and statements to that effect.

As has been seen, the Communist captors isolated men psychologically, confused and terrorized them, attempted to have them "confess" they had performed some act against their fellow prisoners, and introduced an "educational" plan into the void of day-to-day living. During this process they often asked prisoners to act in skits, or to prepare papers or "studies" on various anti-American subjects.

From here it was only a short step to accusation and self-accusation. In many instances this appeared to be the apex of the entire mass manipulation program. Prisoner statements were widely used as propaganda.

If a man could be persuaded to sign a paper accusing his own country of engaging in germ warfare—a particular bogey of the Communists which appears to have been of some propaganda value in some Asian countries —then the report would be widely circulated. That the signer of the statement may have known nothing about the subject, meant nothing to the enemy; the statement could be used at face value.

Classes were instituted in which men stood and criticized, not their actions, but their own thoughts.

This was done while others in the classes commented—or at least were required to comment — on such thoughts. From this the next step was self-accusation of some "misdeed," such as eating too much food at a meal or other action "contrary to interests of the group."

It is somewhat ironical that the Communists made every effort to break down the individual's association with his own group, then held up the group or unit as something to which the individual should be loyal.

This of course added to the Confusion aspect of the entire procedure.

THE ANTIDOTE—*"I will make no oral or written statements disloyal to my country and its allies or harmful to their cause."*

A prisoner of war is required to give only his name, rank, serial number and date of birth. He is expected to resist making any other answers to any other questions. Above all he is expected to resist any efforts to make him discuss his own alleged wrongdoings, or to sign any papers that may incriminate others, or be harmful to his Government.

Study of repatriated prisoners disclosed that those who steadfastly refused to join in any of the classes, to take part in skits or plays, or to make any oral or written statements of any kind finally were left pretty much alone by the captors. But once a man made one statement, it was used to attempt to get further accusatory statements or to lead to signing incriminatory papers. Frequently the first tentative statement, perhaps given in an attempt to gain respite from badgering questioning, was used as a club for further self-accusative details.

Exhaustion

THE POISON—EXHAUSTION. In many instances it was sheer exhaustion, brought about by continued isolation, confusion, terrorization, that permitted victims to be manipulated. To help exhaust individual prisoners, their captors worked on all the human weaknesses—intolerance, frustrations, selfishness. The combination, endlessly repeated, would sometimes reduce an individual to the point where he just didn't care what happened to him. From then on, collapse of will was complete.

THE ANTIDOTE—*The entire Code, especially the last statement "I will trust in my God and in the United States of America."*

If a prisoner of war subjected to the mass manipulation process never allows the enemy to isolate him psychologically or to confuse him, if he withstands terrorization and refuses to make statements accusing himself or others, if he never takes the first step that allows the captor to increase the pressure, he will not give way in the end to sheer exhaustion. He will not give way if in his heart and conscience he remembers and lives up to the guiding principles of his way of life—"to keep trust in God and in the United States of America."

In essence, the Code of Conduct does more than epitomize the moral guidelines that can sustain a soldier through many tribulations; it also sets forth the basic rules that will enable him to survive until the day when adversity gives way to vindication and final victory.

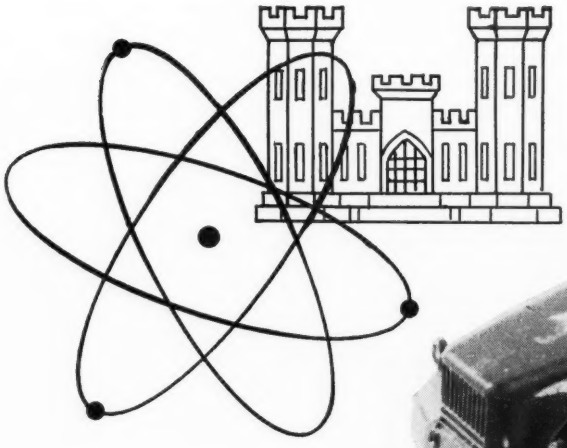
Portable, stationary or afloat,
the Army plans to deliver

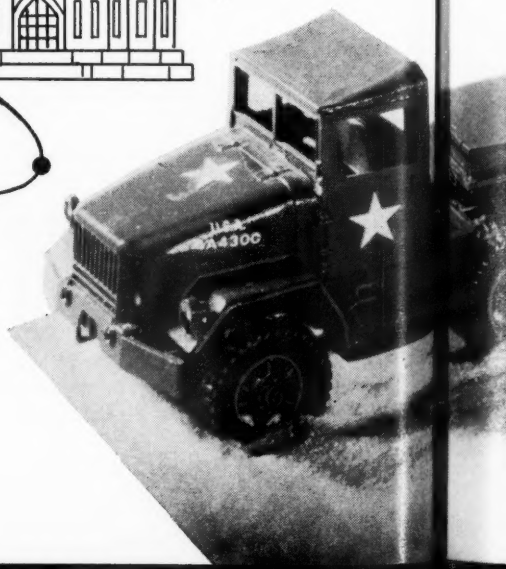
Nuclear Power for M

"WHEN you get 'em on the run, keep 'em on the run."

This ancient bit of military advice is as good today as it was in the days when pursuit of a defeated enemy was accomplished on horseback or by the foot soldier. And it remains just as difficult to achieve! The opposing side can be swept from the battlefield in confusion, but with prompt action by the loser discipline and leadership can soon be restored and an orderly regrouping accomplished.

Perhaps the main reason for this quick-rebound capability has been the historic inability of horses, men or machines to keep up the pace necessary to turn a victory into a rout. In the old days, cavalrymen could not risk foundering their horses in a prolonged chase nor could infantrymen keep up an indefinite pursuit after an exhausting battle. Even today, our mechanized forces and infantrymen can move only as far and as fast as fuel supply trains permit. So the same problem persists—"keeping 'em on the run."





Modern Mobile Forces

Lieutenant General E. C. Itschner, USA-Ret.

Is there an answer?

Can the problem be solved?

If present developments in the Army Nuclear Power Program (ANPP) are any indication, the answer is definitely yes.

Army Nuclear Power Program personnel are hopeful that reactor energy can be used to propel combat vehicles —tanks, for example. Should this be accomplished, mechanized units would be able to slice into the enemy, defeat him and press home the attack until the rout is complete. The only breakdown would be mechanical or human. Imagine, then, what General

Patton would have done with an inexhaustible fuel supply!

Such a propulsion system is still in the formative stage, but it certainly is not considered impossible. In fact, the entire Army Nuclear Power Program, which is conducted under direction of the Chief of Engineers, has made great strides in this direction.

Planning the Program

THE Army Nuclear Power Program was established in 1952 as a joint program of the Department of Defense (DOD) and the Atomic Energy Commission (AEC). In 1954 DOD assigned the Army responsibility for developing nuclear plants required by the three military services to provide heat and power at remote locations. Army assigned the job of conducting the program to the Chief of Engineers. (See "Nuclear Power Program," August 1957 DIGEST.)

Supplying power when and where it is needed—under all conditions—has traditionally been a Corps of Engineers mission. This joint Army-AEC program has opened up boundless horizons for exploration, along with the task of developing a family of nuclear power plants from 100 to 40,000 kilowatts, applying these plants to field use, and training crews to operate them.

Some of these horizons, projected years in the future, include not only prospects for combat vehicles powered by nuclear fission, but the application of nuclear power for use in space as well. Although the Corps of Engineers is concerned with developing "ground-based" power plants for use by the Army, Navy and Air Force, no one has defined what "ground" may be called on the surface of the moon. Experience gained in this program might ultimately be used to design nuclear power plants essential to man's survival on extraterrestial bodies.

Logistical Advantages

THE principal military advantage of a nuclear power plant is its self-sufficiency. Fuel resupply can be on the basis of when feasible and convenient rather than on an essentially continuous basis.

Logistically, nuclear power is indispensable to meeting requirements in certain remote locations. The Corps of Engineers' under-snow installation at Camp Century on the Greenland Icecap would not be practical without such a power source. Preliminary studies indicated that if conventional fuel were used to produce power and heat, the operation of such a camp on a year-around basis would present a tremendous logistical burden. That Camp Century is now being utilized for further investigations of polar regions the year-around is a tribute to the success of the ANPP.

The nuclear power plant installed at Camp Century is being operated by ANPP-trained troops. It produces 1500 KW of electrical energy for light

LIEUTENANT GENERAL E. C. ITSCHNER was Chief of Engineers, U. S. Army, from October 1956 until his retirement in March 1961.

and heat and one million BTU's of steam per hour to operate a steam drill that supplies the camp's water from an undersnow well below the surface.

The Camp Century plant cost about six million dollars — considerably more than a similar plant using diesel fuel. However, the savings in fuel costs are also great. A nuclear core weighing some 800 pounds is the equivalent of more than a million gallons of diesel fuel. The core is transportable by air and is designed to last a year but may actually last longer. An equivalent amount of diesel fuel would have to be transported in small, sea-going tankers, sled and aircraft.

Antarctic Operation

AT the other end of the world in the Antarctic, a nuclear plant similar to the one at Camp Century will be operated by the Navy. It is being assembled in the United States for testing prior to shipment to McMurdo Sound in November.

At McMurdo Sound, it will be assembled by ANPP-trained servicemen and should be in operation by March 1962—the first nuclear plant on that isolated, frozen continent. Later, smaller portable nuclear plants with a power range of from 300 to 1000 KW probably will be installed at the Navy's Byrd and Pole stations.

When all this is accomplished, the need for millions of gallons of diesel fuel, much of it now air-dropped in drums, will be eliminated. At the same time millions of dollars will be saved in supplying heat and electricity.

Varied Locations

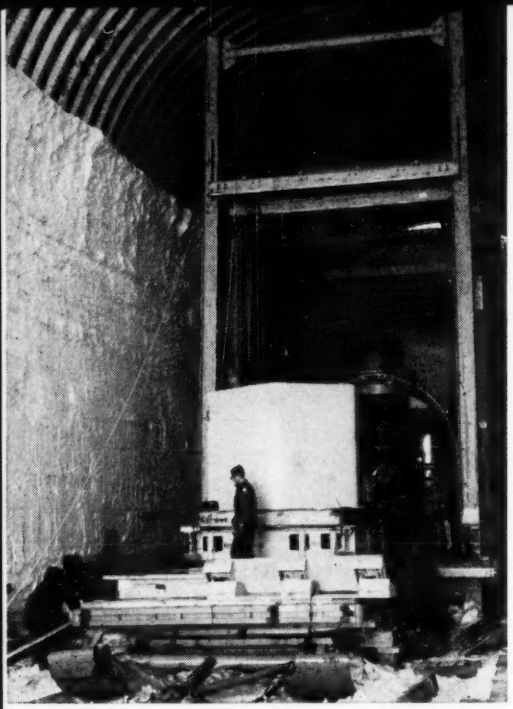
ANOTHER important characteristic of the nuclear plant is its ability to operate without air. This makes the nuclear plant unmatched for hardened missile sites in continental United States — installations which may have to operate "buttoned up" for several days.

Any power plant must have some means of getting rid of large amounts of condenser or exhaust heat, but it appears that natural or underground water, artificially stored, can be used for this purpose.

Vapor condensor component of portable power plant is inched into trench prior to operation at Camp Century.

Right now the Corps is stressing power for remote locations, including sites here in the United States. An example is the Air Force aircraft control and warning station near Sundance, Wyoming, for which a nuclear plant is being designed and built under AEC contract, using AEC and Air Force funds. This plant will be a major improvement in the prepackaged design, but will still produce the necessary power—1500 KW or enough for a town of 1500 families.

The Sundance plant, called a PM-1 or portable, medium power plant, is designed to have increased transportability and reliability. Scheduled to be operational by this fall, it represents a significant improvement in transportability. The plant will be broken down into sixteen units for shipment from the factory to the site. Thus construction time will be in the order of three months instead of the 15 to 18 months required for a stationary pilot plant of this type now



Inside the reactor trench, a construction unit moves another part of nuclear reactor into position on heavy skids.

installed at Fort Belvoir, Virginia.

The new state of Alaska also will have a plant in operation this year. The SM-1A—a stationary, medium-power field plant at Fort Greely—will produce 4000 KW, half for electricity and half for heat. Its design, like the others mentioned thus far, is based on that of the prototype plant which has been in operation at Fort Belvoir since April 1957.

The Fort Belvoir plant is being used for research and development, for generating supplemental power, and for training crews to operate such facilities. During three years of operation, the original fuel core has provided more than 15,000 thermal KW-*years* of energy.

Another plant under consideration is the Corps of Engineers' mobile floating nuclear power station, the MH-1A, which, it is anticipated, would have tremendous possibilities. Generating 10,000 KW, this power source would have a significant advantage in any future war. It could be used in over-the-beach operations simply by moving the barge-mounted plant right up to the shore. Here it would generate power equivalent to 200,000 barrels of oil per year, or five tanker loads, thus making considerable tanker tonnage available for other uses. Award of the design contract for this plant is pending.

Aside from its purely military aspects, such a plant would be of vast help in providing relief to disaster areas—whether in war or in natural disasters such as hurricanes which have wreaked havoc on coastal cities. There is always need for power for hospitals, refugee centers and for getting things moving again.

Cost Factors

THE principal disadvantage of a nuclear power plant is its high initial cost. The capital cost of the plant being built in Alaska, for example, is several times that of a corresponding diesel plant. One of the major objectives of the current development effort is to reduce cost of remote plants, including the high-cost, on-site construction.

Other military disadvantages are that nuclear plants are necessarily heavy because of shielding requirements and are more complex than conventional plants. Operating costs for nuclear plants vary widely, from being considerably more than those for conventional plants in this country to considerably less than those for diesel power plants in remote areas. It is a well-known fact that commercial nuclear plants are not competitive with conventional plants in the United States at this time.

For military purposes, however, the situation may be somewhat different in that economics cannot always be the overriding consideration. Dollar costs are always a matter of primary concern, of course, but they must be

weighed against logistic effort and self-sufficiency as well. Though a nuclear plant may be much more expensive than a conventional power source, one must also consider the value of ships, aircraft and personnel required to deliver fuel oil to remote, critical military installations, and particularly the vulnerability of such logistics support in time of war.

A good case in point would be the shipping losses suffered during World War II. Allied shipping ran a gauntlet of Nazi U-boats, torpedo boats and dive bombers to transport desperately needed supplies, including large amounts of fuel. Shipping losses were extremely high and many lives were lost in keeping the supply lines open.

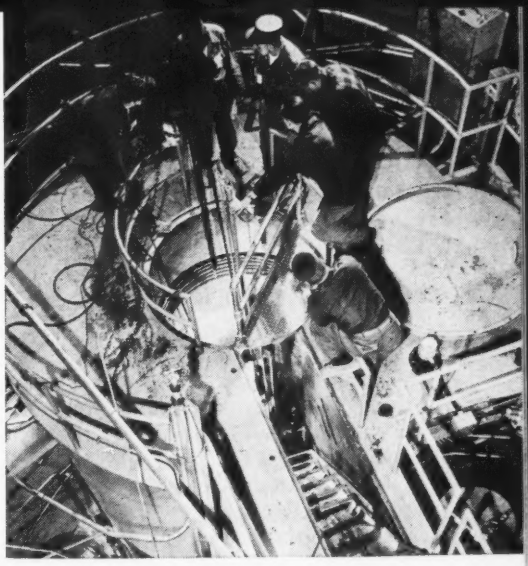
Mobile Field Plants

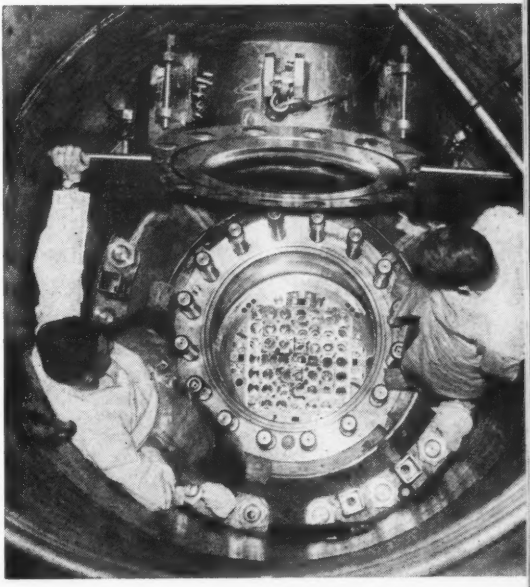
THE greatest single area where nuclear power could be a real revolutionary factor in ground warfare is in the field of vehicle propulsion. Almost 75 percent of all POL consumption in a theater of operations is for this purpose.

The Army Nuclear Power Program has taken the first step in its mobile plant project. The ML-1, the first mobile plant, will be transported on two trucks and a standard Army trailer; and two C-124 or three C-130 USAF aircraft. Power range will be from 300 to 500 KW with the aim of a nuclear core life of 10,000 hours at full power.

The ML-1, a mobile-low power reactor, will weigh about 30 tons; total weight of the reactor system will be on the order of 40 tons. A prototype will begin operation at the National Reactor Testing Station, Arco, Idaho, this spring.

The first field plant is scheduled for delivery to an Army installation in the latter part of 1964. In addition, firm programming exists for two more field plants to be delivered in 1965 and 1966. Purpose of these first field plants is to provide service testing, development of operating concepts, and evaluation by field commanders.





Views of prototype plant at Fort Belvoir show how engineers work inside the vapor container and reactor core.

These plants are still a long way from the propulsive systems mentioned earlier, but they will have the advantage of supplying electrical power for conventional uses without the need for a "logistical tail." This would be especially desirable where power

is needed in remote locations and where resupply is extremely difficult. This could range from West Berlin to the jungles of Africa or southeast Asia.

As with the stationary nuclear power plant, there are disadvantages to the use of mobile field plants as well as advantages. Although this is true of any power system, the mobile nuclear system has the special limitation of requiring protection from radiation. The first models will require an exclusion area of about 500 feet. This means the crew must be at least that far away from the plant after it is turned on.

In addition, the plant will require a 24-hour cool-down time after operation before being moved. However, both of these disadvantages are certainly not permanent. Natural shielding, perhaps a hill mass or bulldozed pit, could reduce the extent of the required exclusion area.

The ML-1 is being designed for use by the Army in the field to support such operations as tactical missile systems, field hospitals, depot maintenance complexes and small, remote installations.

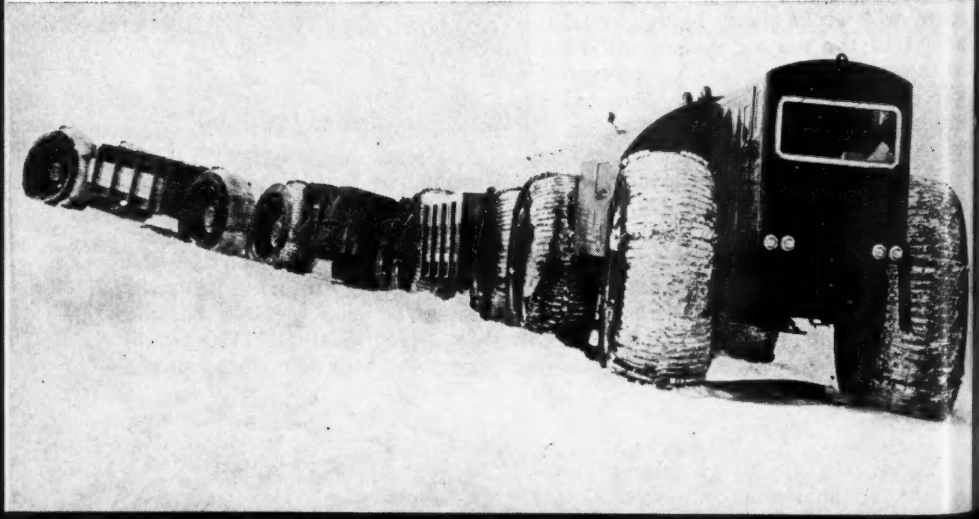
Propulsion for Land Vehicles

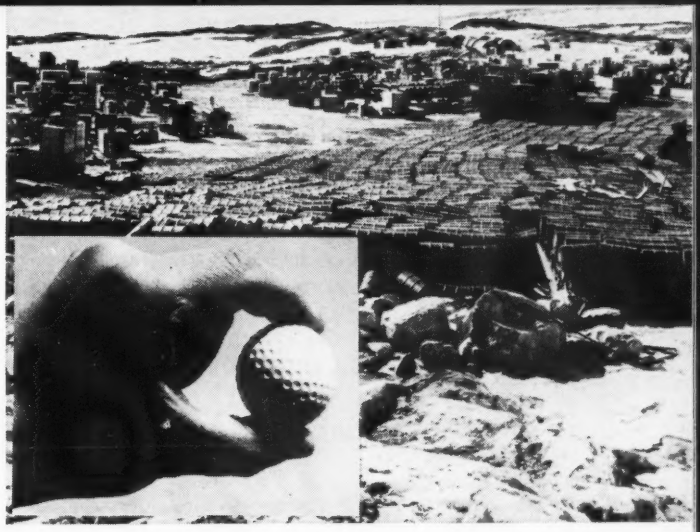
A FURTHER step in this area will be the MM-1 mobile, medium power plant. Besides being compact and lightweight, it will be capable of operating while in motion. This, of course, brings up the possibility of applying nuclear power to the Army Transportation Corps' cross-country or overland train. Such a train is being tested now, but it is diesel-powered and fuel makes up half of its payload.

A nuclear-propelled version would be an unlimited-range logistical support unit as well as a mobile power source. In this version, the power car carrying the reactor would be at the rear, and the crew would ride in front. Ten payload cars with a capacity of around 15 to 30 tons would make up the train.

Another approach in the mobile power field is the ANPP "energy depot" concept. Such a system would be comprised of three components. First would be the primary energy source, the reactor. Second, a fuel would be produced by utilizing reactor energy and indigenous materials, perhaps air and water. And finally, a family of engines would be designed to use this fuel. Such engines would provide the propulsive power for tanks, trucks and similar vehicles. Preliminary studies indicate that a 3,000 KW reactor might support ten tanks or fifty trucks.

Nuclear-propelled version of existing test overland trains would have power car with reactor in rear, crew riding in front, and ten payload cars between.





Golf-ball-size concentration of uranium gives same power as three-month fuel oil supply in background.

But what kind of engines would burn this new fuel? Right now the field is open, but almost any kind of engine might prove to be the ideal. This encompasses everything from fuel cells to conventional engines used in vehicles today.

Actually, such an "energy depot" system appears to be within the realm of possibility today. For example, hydrogen as a fuel could be used in a hydrogen-ogygen fuel cell engine. Overall system efficiency would be quite low, but energy conversion efficiencies in themselves are not necessarily determining in the theater of operations. Logistical efficiencies are often more important. "Getting there first with the most" is as true today and will be so in the future as it ever has been in the past.

Future Applications

FUTURE combat vehicles may be powered by conventional reciprocating, turbine or jet systems using fuel manufactured in the mobile field reactor. Army Engineers have had much experience in manufacturing liquid oxygen in the field for the Redstone missile system. Although this does not involve use of a nuclear reactor, it does point the way for similar thinking.

For some time the Army has been experimenting with air cushion vehicles. Some sort of combination of the jet system, liquid oxygen type plant and mobile nuclear power plant may be the key.

Ultimate in ANPP thinking is the virtually inexhaustible fuel source for the combat vehicle, the nuclear reactor. We are hopeful that such a power source can be developed even though size, weight and especially cost are the big problems today.

While it fills an important role in the reactor development mission of the Atomic Energy Commission, the Army Nuclear Power Program exists basically to provide otherwise unattainable capabilities to the Armed Forces. Since its beginning in 1952, the program has developed an extensive list of reactors for a wide variety of uses. To date most of them have been stationary or portable, with the prime objectives being reduction of size, complexity and cost.

ANPP efforts in the development of small, packaged, and mobile plants are truly unique in the world—a fact in which the Army can take justifiable pride. The program has had an excellent beginning. That it will be carried through to its full potential for all elements of the Armed Forces, there can be no doubt.

In planning, designing, testing new weapons and materiel, USCONARC has a single priority—it's the

Soldier First in

General Herbert B. Powell

DURING pioneer days the American fighting man went off to war armed only with the family musket. He carried a powder horn, a sack of musket balls slung over his shoulder and his pockets were filled with dry rations to eat along the way.

Nowadays, however, the art of war is not so simple. The family musket stays at home in its position of honor over the fireplace and the modern American fighting man goes to war—hot or cold—armed with a multitude

of weapons and tools, each specifically designed and fabricated for the job he must do.

Organizing, training and equipping an Army for the modern battlefield is a tremendous task requiring the combined efforts of combat leaders, military technicians and civilian industry. The job of developing and supplying the equipment rests on the Army's technical services and industry. Employing it on the battlefield is the responsibility of the combat forces. The task of insuring that tools of war currently under development meet the needs of the soldier demands the best civilian and military effort.

Basically, the technical services supply the machines, and the combat forces supply the men. Together, they must provide a man-machine combination which will insure victory on the modern mobile battlefield.

To be sure that the tools of war under development fit the needs and abilities of the soldier, there must be someone to speak for the soldier—to represent him, the Ultimate User, in the complicated development process.

This is one of the missions of the Commanding General, United States Continental Army Command (USCONARC). He represents the interest of the User, *the soldier,* in all phases of Research and Development.

To implement this mission, USCONARC has two general staff sections, Combat Developments and Materiel Developments, headed by a Deputy Commanding General for Developments. (*See chart.*) All military personnel—the User Representatives in these staff sections and their supporting agencies—are selected combat arms officers and enlisted men with recent field experience. Expert technical assistance is also available.

Research and Development

Development Cycle

USCONARC has two rather distinct and easily definable missions in the development cycle.

First, and prior to actual development, USCONARC states the requirement for an item or system and lists its necessary operational and performance characteristics.

This is accomplished by the Combat Developments (CD) Section whose area of primary concern is future combat organizations, new tactics and requirements for integration of new materiel. Two agencies work directly under CD. They are the Combat

Development Experimentation Center (CDEC), at Fort Ord, California, where experimental organizations and methods of operation are tried out with troops, and the Office of Special Weapons Development (OSWD), where the application of atomic weapons is studied.

Although not directly under CD, all of the various Combat Developments Sections throughout the Army are subject to guidance by CD Section, USCONARC. For operational flexibility this is performed by direct contact and not through command channels.

Materiel Developments (MD) Section implements the next stage in the development cycle. Specifically, this section is charged with the User's definition of new equipment, monitoring its development and finally testing it with troops under simulated tactical conditions. To assist in carrying out these responsibilities, MD Section has seven boards and twenty-one liaison officers.

Human factors receive primary consideration in all stages of development. In preparing the statement of required military characteristics, the over-riding consideration is that the equipment must be controlled by, operated by and maintained by *men*. And in the conduct of the service test, the objective is to determine the functional suitability of the man-machine combination.

Normally and in most instances, the developer should be able to accomplish this fitting together of man and machine without much guidance or interference from the user. The scientists and engineers who design and make the equipment are certainly aware of man's physical and mental capacities and limitations. They know how much weight a man can lift and carry, how far he can see, and how many dials he can twist or levers he can pull at one time. In short, the scientist and engineer generally are able to provide the man-machine combinations which fit and function properly under the serene, controlled conditions prevailing in laboratories and proving grounds.

Unfortunately, that is not enough. Battles are not fought under the conditions which prevail at Aberdeen or at other such proving grounds. Battles are fought amid conditions of almost indescribable confusion in locales having the widest extremes of weather, climate and terrain; battlefield equipment is operated and maintained by men undergoing extremes of mental and physical stress.

All these factors greatly complicate the problem. They account for the major role given to the military User Representative in the design phase of development; they dominate the conduct of final user tests.

If the User Representative merely states the requirement, prepares the military characteristics and then sits back and waits for the equipment to

General Herbert B. Powell
Commanding General,
U. S. Continental Army Command

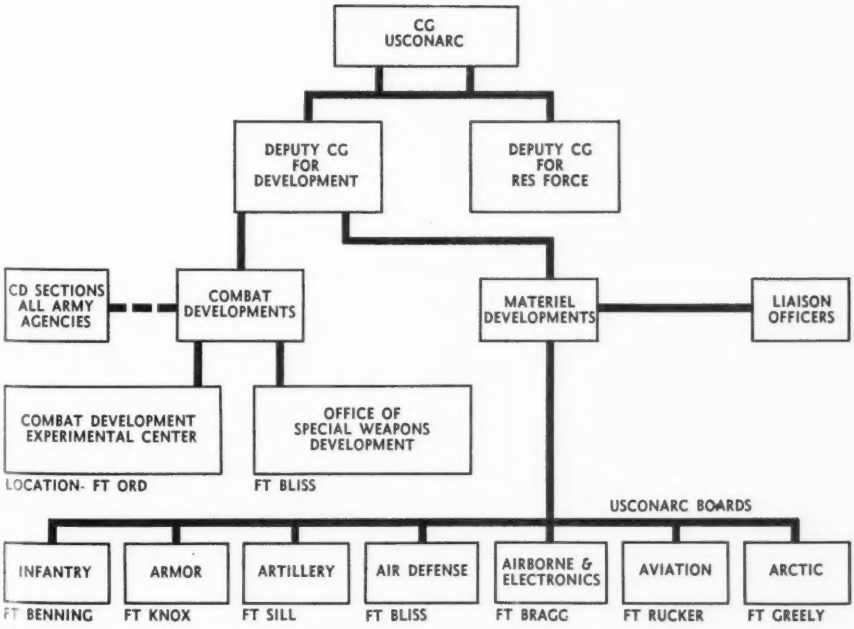
be handed to him for service test, he has not done his job. The user test, if properly conducted, will reveal any deficiencies which might exist in the man-machine combination. But by then it is too late. Correction of deficiencies at that stage of development is costly and time-consuming. Expensive modifications, engineering design changes, retesting are almost always required. The User Representative must get into the act earlier and stay in it throughout the entire development process.

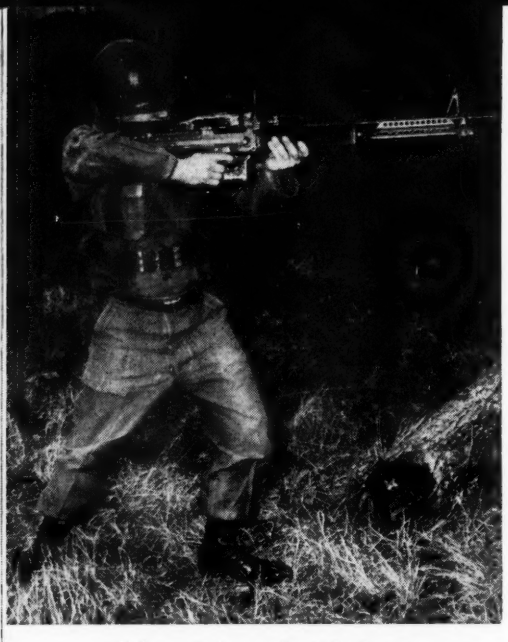
The User Representative must keep the developer aware of these complex battlefield conditions at all stages of development. He must let the design engineer, working on his original drawings, know with as much accuracy as possible, just how, where, when and by whom the item is to be used. He must continue to provide such information throughout all of the other developmental stages, including construction of mock-ups and prototypes and the conduct of technical and engineering tests. With everyone engaged in the development of an item kept aware of the desires of the Ultimate User, it is possible to eliminate many design errors and the expensive changes they generate in the late stages of the development cycle.

All this, of course, will not eliminate the need for final service tests in which the equipment is teamed with soldiers under simulated battlefield conditions. Service tests will continue to reveal deficiencies and need for design modification. But the guidance furnished by the User Representative should eliminate a great many of the more easily recognized design errors which frequently creep into our military equipment. The earlier such errors are recognized and corrected, the more time and money will be saved.

Applying effective user guidance to the developmental effort requires a great deal of cooperation and effort

USCONARC ORGANIZATION FOR DEVELOPMENTS (SIMPLIFIED)





Before being adopted for issue to troops, the M60 machine gun was thoroughly tested by Infantry Board.

on the part of everyone concerned—both developers and users. USCONARC User Representatives must supply the well-thought-out, coordinated guidance based upon known battlefield practice and conditions, but geared to future organizations and concepts.

User Guidance

FOR the most part, the developers are not only receptive to User guidance; they actively seek it. Engineers and technicians from technical services and industry seldom miss an opportunity to ask a combat soldier what he thinks of a particular item of equipment which they have under development. The soldier never fails to respond, to speak his piece.

But such guidance, given on the spur of the moment without careful study, is dangerous. Almost always, the opinion expressed is based entirely upon the adviser's own personal combat experience. If he fought in the jungle, his views will be colored by jungle warfare considerations. If he served in the far north, he may be unduly concerned with how the item will work at below-zero temperatures while operated by a soldier wearing arctic mittens.

Seldom, if ever, will such off-hand opinions represent a broad background of experience coupled with a thorough understanding of future concepts. No one individual, regardless of his experience and professional military competence, can provide much worthwhile User guidance after cursory examination of a design or mock-up, or in reply to off-hand questions.

These factors are sometimes reponsible for user-developer conflict. The User is dissatisfied because his wishes are not reflected in the developer's product. The developer is frustrated by his inability to find out precisely what the User wants.

To preclude such conflict, USCONARC must anticipate problems that the designer will encounter and be prepared to furnish him with timely and detailed User guidance.

Second, the developer is urged to call upon the User Representative for specific guidance and evaluation at specific stages of development—such as completion of engineering design, fabrication of mock-ups, and production of prototypes.

Early knowledge of an item's intended battlefield use is essential for the developer. The modern, mobile battlefield is far more complex than the one encountered in World War II and in Korea. Tactical organizations and concepts are constantly changing with the introduction of new weapons systems.

So far, the term "User guidance" has been used in a rather general sense. User considerations in the development of military hardware are almost entirely human factors considerations. When a new piece of equipment is developed, the user is concerned with how many men will be needed to operate it, how much train-

ing will be required, how difficult it will be to maintain, how easily men can transport it, how quickly it can be put into or taken out of action, how effectively men can employ it.

For instance, the USCONARC development team is not much concerned with the ballistic accuracy of a weapon fired from a bench rest under controlled conditions. But it is vitally concerned with how accurately a man can fire it under the variable conditions of the battlefield. Similarly, from the User's point of view, the maximum speed capabilities of a vehicle are often secondary to how fast a man can drive it on the battlefield.

As the effectiveness and complexity of equipment increases, our reliance on the human ability and manpower required to employ them also increases. In short, User guidance in the design of military equipment is primarily concerned with applying the human factor to equipment design.

Seven Boards

USCONARC's direct participation in the development cycle is performed by seven specialized field agencies known as USCONARC Test Boards —six located in Continental United States and one in Fort Greely, Alaska.

Their primary mission is to conduct the service test by placing developmental materiel in the hands of soldiers for field test under simulated combat conditions. The emphasis is on measuring equipment performance in the envisioned operational and organizational environment with the type of soldier who eventually uses the equipment.

Board personnel represent a general cross-section of the Army. In spite of the technical nature of their job, they are not over-balanced in favor of the scientific and technical, although some individuals with technical qualifications are assigned to supervise tests from the standpoint of scientific validity.

The bulk of the soldiers at the Boards possess the experience and training levels normal to their branch. Thus they are able to demonstrate whether or not the new materiel can be used effectively in the field.

Introduction of far-ranging missiles into the artillery now calls for testing by Artillery Board of complex items such as tellurometers, gyro-azimuth theodolites.

The size of the Boards varies in proportion to the emphasis currently being placed on their area of interest. Reflecting recent emphasis on missiles, the Air Defense and Artillery Board is USCONARC's largest test agency. On the average, the various Boards are each composed of about 40 officers, 250 men and 55 civilians.

The location of the Boards is significant. With one exception, all are located on the same post as the corresponding service school. This allows an exchange of information at the action level between the Combat Development Office (CDO) of the School and the Board. As an example, the CDO of The Infantry School at Fort Benning, Georgia, can discuss doctrine in its formative stages with Board personnel who are testing new infantry weapons. The Board thus is in a position to offer comments on the way in which a new weapon may support new tactics or doctrine.

The exception to this convenient station arrangement is the Airborne and Electronics Board at Fort Bragg, North Carolina. Here the absence of a corresponding service school is partially offset by the opportunities to coordinate airborne matters with the XVIII Airborne Corps.

Board Missions

THE mission areas of the Boards are evident in their titles.

Artillery Board is charged with responsibility for testing field artillery weapons and equipment. The main portion of the Board is at Fort Sill, Oklahoma. A separate Missile Division is located at Fort Bliss, Texas, where Board personnel can take advantage of the facilities of nearby White Sands Missile Range.

Armor Board at Fort Knox, Kentucky, conducts user testing of armor equipment. It has additional responsibility for the automotive portion of all tests as well as tests of combat engineer equipment.

Air Defense Board at Fort Bliss, Texas, tests air defense systems and electronic countermeasures associated with air defense. It also has test responsibility for atomic demolitions.

Airborne and Electronics Board, as its name implies, has two rather broad and divergent areas of interest. The Electronic Division tests communication equipment, combat surveillance systems and automatic data processing equipment. The Airborne Division tests equipment and procedures for aircraft delivery of Army troops, supplies and equipment. The Board also is active in testing special warfare equipment.

Aviation Board at Fort Rucker, Alabama, tests Army aircraft and equipment used in support of aircraft, or in the performance of aerial missions.

Infantry Board tests not only infantry weapons and equipment, but also conducts user tests of field rations, individual equipment common to soldiers of all branches, and certain chemical warfare items.

Arctic Test Board at Fort Greely, Alaska, has a functional rather than branch-oriented mission. Here equipment used by all branches is tested to determine suitability under arctic conditions. This includes exposure to environmental problems peculiar to arctic summers, such as the muskeg, as well as tests under the more commonly visualized winter conditions.

The Board at Fort Greely is concerned with three broad categories of equipment: Items designed specifically for aretic use, such as skis and parkas; items for which a cold weather modification is required, such as a general-purpose truck and winterization kit; and items intended for worldwide issue for which a cold weather kit would not be practicable, such as the M14 rifle.

Additional Activities

USCONARC Test Boards have other interests besides the field testing of hardware.

A first step in the development

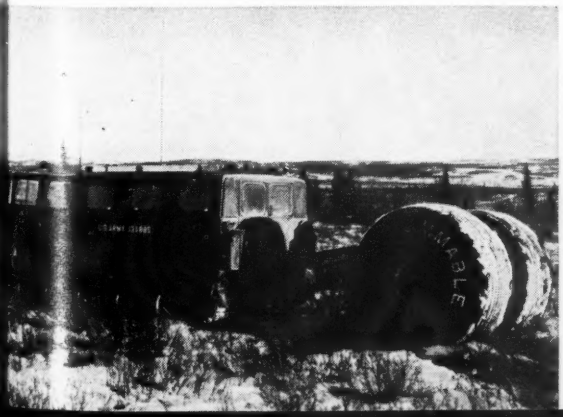
Mine clearing roller on M48 tank sets off explosion during tests.

Explosive line charge also is used to clear path through mine fields.

Service tests of the M60 tank are carried out by the Armor Board.

Mobility of new cargo and tank truck is tested at Detroit Arsenal.

Amphibious cargo carrier with rolling liquid transporter is tested.



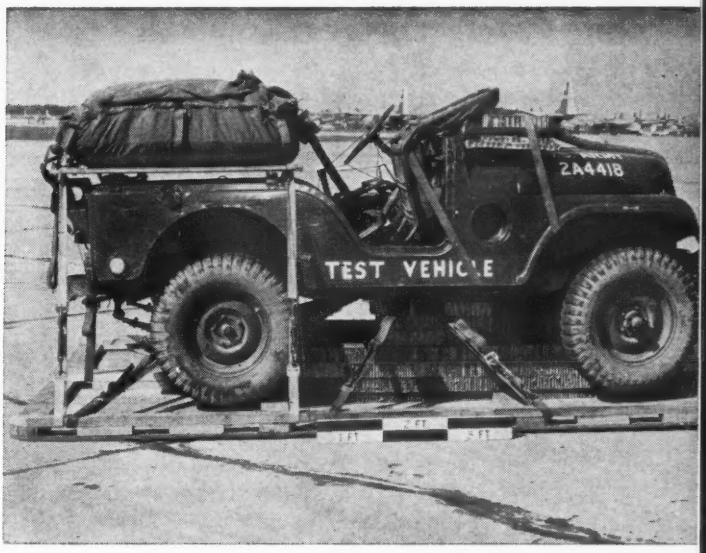
Often called a "Swing Hook," the Improved External Cargo Sling System is installed for severe, thorough tests of its capabilities on an H-21 helicopter.

cycle—the drafting of descriptions of new materiel, known as Military Characteristics — is performed by Board personnel.

The Boards also maintain close contact with the technical services and with civilian contractors who develop new equipment. This is accomplished primarily through USCONARC liaison officers stationed at arsenals, laboratories and manufacturing facilities throughout continental United States. These officers bridge the gap between USCONARC and its test Boards and the developers who fabricate prototypes of new equipment.

Besides observing development and making spot reports to the USCONARC staff and to the Boards, liaison officers are available to resolve prob-

Aviation Board performs tests on AO-1 Mohawk, a twin turboprop craft with 150-gallon resupply and drop tanks, designed to operate from small unimproved fields.



Securely lashed to a heavy reinforced frame, vehicle is prepared for test drop from air.

lems which inevitably arise over conflicting requirements. Whenever necessary, the liaison officer consults with the Boards and USCONARC, then transmits to the developer the compromise decision as to which characteristic is most essential.

Lead Time Factors

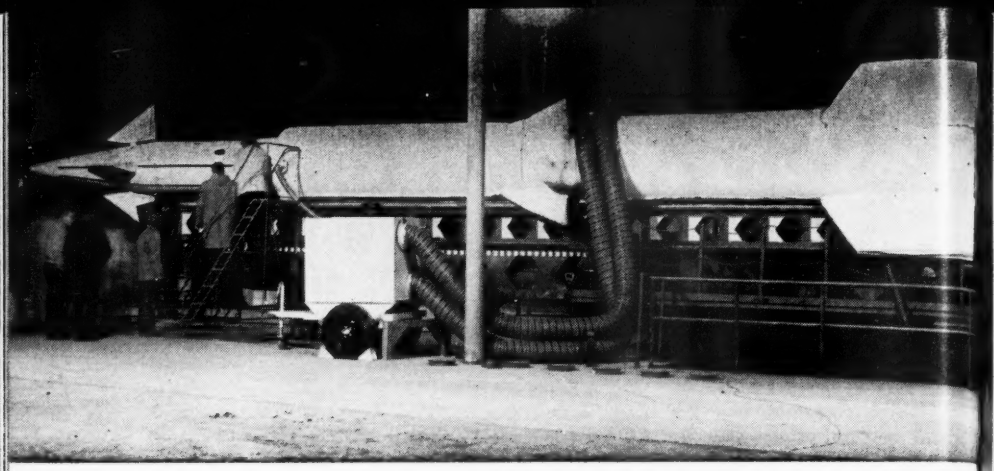
THE entire cycle of development in which USCONARC has such a vital interest is a rather disappointingly long one. Continual emphasis is being placed on the reduction of "lead time"—the time interval between the expression of the original concept and the issue of new equipment to troops.

There are no "average" cases in the highly individualistic process of materiel development. Dependent upon its complexity, a new item may require from three to ten years of lead time. This time is consumed in documenting a requirement, developing a prototype, testing it and procuring it from industry for eventual issue to field units.

Development Cycle

THE first action in the USCON-

Personnel testing a new magnesium snowshoe are airlifted to arctic snowfield by means of H-37 helicopter.



Working late into the night performing intricate tests on Nike-Zeus, crew members put heater blankets in place on missile during pre-firing preparation.

ARC development cycle is the statement of the requirement for new materiel. Anyone in the Army can suggest new developments, but it is the staff responsibility of the Combat Developments Section at USCONARC to prepare the formal statements of requirement for approval by the Department of the Army.

Approved requirements are published in a volume called the *Combat Development Objectives Guide* where they serve as guideposts to U. S. research and development agencies. These approved requirements, amplified technically by the detailed descriptions of military characteristics, are then passed to one of the Army's technical services with directions to proceed with development.

Calling on the background of basic research already performed, the Chief of the designated technical service assigns the new project to one of his arsenals. Here work begins on the fabrication of a prototype item, or the project may be contracted out to private industry.

Next, the completed prototype is subjected to an engineering test at an appropriate facility such as proving grounds operated by Ordnance Corps at Aberdeen, Maryland, and Chemical Corps at Dugway, Utah. Object of this engineering test is to determine, in a scientifically controlled environment, if the new item possesses all intended design characteristics.

Following the engineering test, the service test is performed by a USCONARC Board.

If the service test uncovers no major problems, the new item is ready for adoption as a standard type. If it does not pass this test, a period of modification and retesting will be required.

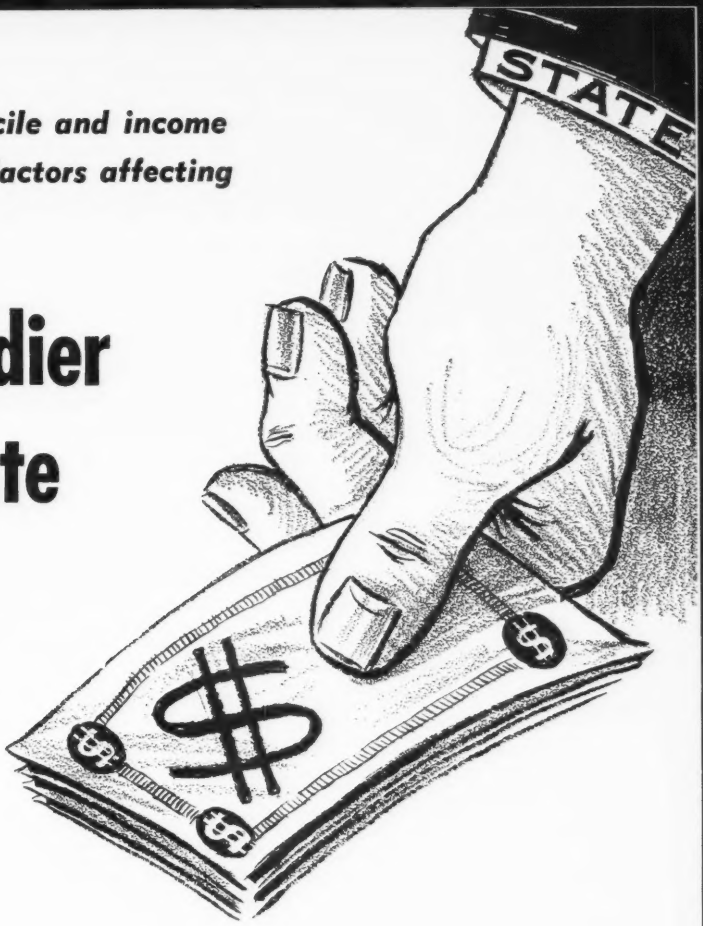
After adoption as standard, the new item undergoes industrial engineering. During this process the handmade prototype is redesigned to make it susceptible to modern mass-production methods.

If the new piece of equipment is a complicated one, such as a tank or other automotive item, USCONARC performs a confirmatory test of a production model. Purpose of the confirmatory test is to detect and correct any defect which may have crept in during industrial engineering.

When all these hurdles have been cleared, the new materiel is ready for full-scale production and issue to troops. The development process has gone full cycle, and the American ground combat soldier is one step closer to the readiness which is the Nation's greatest hope for victory and peace.

Residence, domicile and income are controlling factors affecting

The Soldier and State Income Taxes



Lieutenant Colonel Carl E. Winkler
and
First Lieutenant Thomas R. Manning

WHILE it is a basic principle that military service does not relieve servicemen and their dependents from the obligation to pay income taxes to state and local governments, the determination of what to pay which government is not always a simple matter. For this reason, a discussion of some general principles applicable to income tax obligations of servicemen and their dependents may serve to lighten somewhat the task of fulfilling this obligation.

LIEUTENANT COLONEL CARL E. WINKLER, Judge Advocate General's Corps, is Chief, Legal Assistance Division, Office of the Judge Advocate General. FIRST LIEUTENANT THOMAS R. MANNING, JAGC, is Chief, Tax Branch in the same office.

A question often asked of Army Legal Assistance Officers by servicemen is: "Do I have to pay any state income taxes?"

Before an answer can be attempted, at least three determinations must be made—the actual residence of the individual; his domicile; and the nature and source of his income. These determinations constitute the basis of the right of a state or local government to tax income.

Actual residence is where the service-

man lived during the taxable year. In some states a person who lives in a state for more than a certain number of months (usually six or seven) is considered by that state law to be a "statutory resident" subject to tax. The provisions of the Soldiers' and Sailors' Civil Relief Act prevent a serviceman from becoming a "statutory resident" for purposes of taxation in any state other than his state of domicile provided he is absent from his state of domicile solely by reason of military orders. Because the wife and dependents of a serviceman are not covered by the Act, they may become "statutory residents."

Domicile has been defined as "that place where a man has his true, fixed, and permanent home and principal establishment, and to which whenever he is absent he has the intention of returning." Thus, by definition, an individual has only one domicile at any one time.

For a bachelor who is serving a short tour of active duty and who intends to return to the home in which he was living at the time of enlistment, the application of this definition presents few problems; and, if his home state has an income tax, his income may be subject to that tax.

If his total income consists of service pay, it is not necessary to consider the income tax laws of any state other than his domicile. Under the terms of Section 514 of the Soldiers' and Sailors' Civil Relief Act, his military pay may not be taxed by any state other than his domicile if he is absent from his domicile solely by reason of military orders. But if he has other income, as from a part-time job at a local gas station, he may be subject to tax on this income by both the state of his domicile and the state in which the income is earned. It then becomes necessary to examine the laws of the two states to determine whether or not any credit or deduction is available to offset or reduce this double tax.

For the married man, the given definition of domicile will not solve his income tax problems if his wife or dependents have separate income.* There are two basic reasons for most difficulties encountered in this situation. First, the tax provision of the Soldiers' and Sailors' Civil Relief Act does not exempt the income of a wife or dependent of a serviceman from taxation by the state where stationed. Second, the question of domicile becomes more acute with respect to the wife and dependents of a serviceman, because domicile may be acquired in any one of three ways—by birth, by choice, and by operation of law.

When a child is born he automatically acquires the domicile of his father. Generally, this domicile follows any change in his father's domicile as long as the child remains a minor and lives with his parents.

Domicile by choice is acquired when an individual abandons his domicile, moves to another jurisdiction and while there forms the intention to remain permanently.

An example of a domicile acquired by operation of law occurs when a woman marries. Although there is not universal agreement on this point, many states hold that upon marriage a woman acquires the domicile of her husband whether or not she has lived there.

As can readily be seen, this last method of acquisition of domicile presents further problems. Is a working wife who is subject to income taxes in the state of her employment (the serviceman's duty state) also subject to the payment of income taxes to the state of her husband's domicile, which domicile she acquired upon marriage? She may be taxed by the state of her domicile and also by the state in which she is employed unless the laws

*A discussion of problems presented where the serviceman is domiciled or stationed in a community property state—such as Arizona, California, Idaho, Louisiana, New Mexico and Texas—is beyond the scope of this article.

of the state of her domicile permit her to acquire a separate domicile for tax purposes. Because state laws are not uniform on this point, the Legal Assistance Officer should be consulted.

Determining Domicile

A SERVICEMAN may be required to prove his domicile to the satisfaction of state taxing authorities. Department of the Army Pamphlet 355-8, *Your Personal Taxes* (July 1957) sets forth some of the tests to be considered:

(1) Place of birth;
(2) *Permanent* residence of father;
(3) Family connections—close friends;
(4) Address you give for military purposes;
(5) Payment of state bonus—in many cases, the serviceman must be a permanent resident to be eligible;
(6) Civic ties—church membership —club or lodge membership;
(7) Bank account or business connections;
(8) Payment of state income taxes —this is almost conclusive evidence of *permanent* residence;
(9) Continuous car registration and driver's licenses;
(10) Listing of "legal" or "permanent" address on Federal tax returns;
(11) Voting by absentee ballot—this is one of the best tests to determine *permanent* residence;
(12) Occasional visits or spending one's leave "at home";
(13) Ownership of a home;
(14) Execution of approved certificates or other statements indicating *permanent* residence;
(15) Expression of intention—as in designation of a legal residence in a last will and testament, power of attorney or other legal document.

Obviously, not all these factors apply in every case. No one factor is conclusive evidence of domicile. There is a rebuttable presumption that the state in which a serviceman is domiciled at the time he entered the service will continue to be his domicile until separated. If the state or locality in which the serviceman is stationed requires the submission of a questionnaire to substantiate a claimed exemption from taxation under the Soldiers' and Sailors' Civil Relief Act, a Legal Assistance Officer should be consulted prior to submission of the completed form.

Income Source

IN ADDITION to actual residence and domicile as grounds for income taxation, a state may impose a tax on income which is derived from a source within its borders. This situation commonly exists when a serviceman purchases a house in a state where he is stationed. For example, a soldier while stationed in State X pays income tax to his state of domicile, State Y, on his military pay which is his sole source of income. Upon receiving permanent change of station orders to an installation in a third state, State Z, he attempts to sell his house in State X. However, because he is unable to locate a buyer before leaving State X, he rents the house. He then becomes subject to income tax on this rental income to State X because he is deriving income from a source within that state.

Furthermore, his state of domicile, State Y, may also tax this rental income in addition to his military pay because a domicile state can tax all income from whatever source derived. State Z, the new duty station, cannot tax his military pay because he is not domiciled therein; he is absent from State Y solely by reason of military orders.

If title to the house in State X is in his name alone, State Z may not tax the rental income for the same reason. However, if the title to the house is in his name together with

his wife, and if she is entitled to one-half of the rental income under applicable law, one-half of the rental income may be taxed by all three states, if during the taxable year the wife resided in State Z long enough to be considered a "statutory resident" for tax purposes.

After the actual residence, the domicile, and the nature and source of income are determined, it is necessary to examine the laws and regulations of the various states involved to determine whether or not an income tax must be paid.

Local Aid

A LEGAL Assistance Officer of any of the services may be consulted with respect to state income tax problems. Although his many duties render it impossible for him to complete tax returns, he will furnish any information available to him with respect to military and non-military exemptions, exclusions, deductions, filing dates and methods of obtaining extension thereof, tax rates, and tax credits. All of these items must be considered before it can be determined how much, if any, tax is due.

Even though no tax may be due, it is often necessary to file a return because deductions and certain exemptions and exclusions are not available unless shown on a return. The timely filing of a correct return may preclude later difficulties.

Where no return is filed, the general rule is that a state may assess a tax at any time. Because the burden of proving that a return was filed rests with the taxpayer, it is advisable to send all returns by certified mail requesting a "return receipt" from the Post Office. Of course, all canceled checks should be retained together with duplicate copies of tax returns as proof of filing and payment.

The Soldiers' and Sailors' Civil Relief Act does not exempt from state income taxes active duty pay received while stationed overseas. Some states have provisions for deferment of filing returns while stationed overseas; some even permit extensions while on active duty in United States; and one state (Utah) will exempt overseas pay if specific conditions are met. However, as a practical matter, it is not wise to allow tax debts to accumulate.

Because there is no withholding from military pay for state taxes the serviceman is forced to budget in order to meet state income tax obligations. Currently a copy of the Federal Withholding Tax Statement (W-2) is supplied to the state in which he is stationed.

The fact that an individual does not receive a packet of tax forms from his state of domicile does not relieve him of the obligation to satisfy his income tax obligations to that state. However, if a serviceman is domiciled in a state (or city) which does not impose an income tax, or which exempts his military pay, he cannot be required to pay tax on his military pay to any other state or locality while he is absent from his domicile solely by reason of military orders.

For those who neglect to file returns, the states have several means of gathering information and collecting taxes from delinquent taxpayers. Among the less obvious aids are the reciprocal tax collection statutes enacted by twenty-six states and the inspection of Federal income tax returns as authorized by Title 26, United States Code, Section 6103.

It can readily be seen that, because of frequent changes of duty station, the soldier is likely to encounter peculiar and complicated state income tax problems. However, with the guidance of a Legal Assistance Officer, he should be able to present intelligently the pertinent facts and suggested solution to state or local tax officials, who, with very few exceptions, appreciate his problems and recognize the protection afforded by the Soldiers' and Sailors' Civil Relief Act.

*Income Tax States**	*Service Pay Exemptions and Exclusions, If Any*
Alabama	
Alaska	
Arizona	First $1,000 active service pay exempt
Arkansas	Active service pay excluded
California	First $1,000 active service pay exempt
Colorado	First $2,000 active service or reserve duty pay excluded
Delaware	Domiciliaries should consult a Legal Assistance Officer
District of Columbia	
Georgia	
Hawaii	Service pay excluded
Idaho	Active service pay of domiciliary exempt if serving outside Idaho for the entire year
Indiana	Active and inactive service pay exempt
Iowa	
Kansas	First $1,500 active service pay excluded
Kentucky	
Louisiana	
Maryland	
Massachusetts	
Minnesota	First $3,000 active service or reserve duty pay excluded
Mississippi	
Missouri	First $3,000 active service pay exempt
Montana	
New Hampshire	
New Mexico	
New York	Domiciliaries should consult a Legal Assistance Officer
North Carolina	
North Dakota	Active service pay exempt
Ohio	No Ohio personal income tax, but local income taxes in some cities
Oklahoma	First $1,500 active service pay excluded
Oregon	First $3,000 active service pay excluded
Pennsylvania	No State personal income tax, but local income taxes in some cities
South Carolina	
Tennessee	
Utah	If overseas, consult Legal Assistance Officer
Vermont	
Virginia	
West Virginia	(Recent legislation imposed income tax on income earned subsequent to January 1961)
Wisconsin	First $1,000 active service or reserve pay excluded

*Individuals serving in or domiciliaries of a territory or possession of the United States should consult a Legal Assistance Officer.

Thousands of man-management years are represented in the pooled experience of faculty and students at this

School for Army Manager Leaders

Colonel William W. Culp

SINCE its establishment in 1954, three thousand generals, colonels, lieutenant colonels and senior civilians have contributed and benefitted from instruction at the U. S. Army Management School, Fort Belvoir, Virginia. In the diversified backgrounds of each class more than one thousand years of knowledge and experience are represented.

Management Memos:

"Today the good commander must be the good manager. In many ways it is more difficult to provide effective leadership in the management field than in the tactical field, but it is as essential in the office as on the battlefield."

"In the complexity of today, tomorrow will belong to the imaginative and the resolute who anticipate —to those who initiate action to forestall problems—to those who initiate change and react promptly to challenge."

"It is possible to improve procedures—they are printed on paper, not hewn in stone."

This Armed Services senior school of executive development conducts a three-week Management Course nine times annually and a one-week Management Orientation Course for general officers and senior civilians twice annually. Courses and programs of instruction are approved by the Commanding General, U. S. Continental Army Command.

The School has the mission of assisting *commanders* and *selected staff officers* and *civilians* to perform managerial functions pertaining to installations and activities. Additionally, the School monitors Army management instruction and provides instructional materials to 17 Army service schools.

Philosophy and Curricula

PRINCIPAL purpose of the school is executive improvement and development, including dissemination of the latest thoughts on managerial procedures and techniques. Its aim is to foster an atmosphere which encourages innovation and new ways of getting things done more effectively and less expensively. It is a school of creative initiative and healthy skepticism, dedicated to intellectual curiosity and constructive discontent, encouraging intellectual friction and creative problem solving. (See "Where Principles

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COLONEL WILLIAM W. CULP, Armor, is Commandant, U. S. Army Management School, Fort Belvoir, Virginia.

and Practicalities Meet," May 1959 DIGEST.)

Courses encompass the two broad areas of Army management—the functions of management as performed by organizations, and the functions of the manager as performed by leaders.

Approximately half of the instruction is concerned with the impact of an individual's attitudes and habits on his effectiveness as an Army manager. This is demonstrated through case analysis including the "incident" type case, role playing and group action. A series of cases based on actual situations at military installations and headquarters is discussed by the class. Each case highlights one or more practical problems in the field of Army Management.

From the wealth of experience available in each class, a variety of possible solutions is found for each problem. Every opportunity is provided each participant to explore possible solutions with a view to their adaptability to his local situation.

Since the class contains representatives from installations, major commands and the Department of the Army, there is ample opportunity for exchange of thoughts and ideas. Thus a new and valuable link is forged in the communication chain, from the top down and the bottom up.

The remaining half of the instruction is designed to increase managerial knowledge and skills through numerous faculty and guest presentations covering the philosophy and broad spectrum of Army Management, including the Army Command Management System. Faculty members conduct seminars, practical exercises and discussions.

One of the exercises, Fort Simulation, teaches installation management by simulating actual operation of an installation, with effectiveness of performance computed electronically and scored on a competitive basis. Insofar as it is known, this is the first major exercise of this nature employed at an Army school. (*See page 46*)

Eminent guest speakers provide current thoughts on a wide range of managerial subjects. A stimulating exchange of information takes place during exercises, case discussions, seminars and informal evening discussion groups.

Throughout, emphasis is on the ever-fleeting area of problem solving at top military management levels. The basic reason for the Army's existence—to be trained and ready for combat in the defense of our Nation—is kept in constant focus.

The U. S. Army Management School is designed to further the development of mature and experienced officers holding responsible positions Army-wide. Courses are open to general officers, colonels, lieutenant colonels, and GS-13's and higher—the top Army manager-leaders who will reap the greatest professional reward from attendance, and who will provide the greatest contribution to the Army after graduation.

At formal discussions, above, or in a more informal atmosphere, below, management problems are examined.

Managing Men, Money and Materiel
At Fort Simulation Provides

21 Months Experience In 21 Hours

AT the U. S. Army Management School, Fort Belvoir, Virginia, an ingenious exercise has been devised to simulate 21 months of Army management experience in 21 hours.

"The basic reason for the Army's existence—to be trained and ready for combat—is kept in constant focus."

Electronic equipment, above, scores performance effectiveness of solutions evolved by student groups, below.

Individuals are assigned to six installation staffs which operate a theoretical class I installation known as Fort Simulation. The decisions required involve the use of men, money, and materiel to accomplish five major assigned missions. Decisions are processed electronically by a computer and results are scored each quarter on a penalty basis to indicate which staff has made the best utilization of available resources.

The requirement for resources is developed from projected workloads and experience standards. Normally, requirements exceed available resources, and the staffs are required to apply mission priorities in establishing cost ceilings. The exercise emphasizes the need for properly *balancing* manpower, supply, and contractual service resources.

PERHAPS the most challenging aspect is the requirement for decisions involving the management of installation-owned inventories. The necessity for maintaining levels of supply which are adequate to support programmed operations finds participants emerging from the dilemma with a better understanding of field stock control and the relationship between costs and obligations.

Through such simulation, management of Army resources can now be practiced in the same manner that tactics and strategy have been successfully played through maneuvers, CPX's and war gaming.

At the U. S. Army Management School—

Creative Problem Solving Seminar

A THREE-DAY Military Creative Problem Solving Seminar recently conducted at the U. S. Army Management School, Fort Belvoir, Virginia, brought together more than 80 senior military and civilian members of the three services. They examined ways and means of achieving a breakthrough into new frontiers of creative decision making. The seminar was conducted by Creative Education Foundation of Buffalo, N. Y.

Creative principles, techniques and procedures which were evaluated for their military application have been time and profit-tested in business operations. Speakers included Professor Lee B. Moore of Massachusetts Institute of Technology; Mr. Joseph A. Anderson, Vice President of General Motors Corporation; Dr. James E. Gates, Dean of the University of Georgia's School of Business; Chancellor Clifford C. Furnas, University of Buffalo; and Dr. Lee H. Bristol, Jr., and Dr. Alex F. Osborn, President and Board Chairman respectively of Creative Education Foundation.

The seminar sought to point up attitudes and approaches conducive to a breakthrough in the creative decision-making process that would be helpful to the services in performing their vital security missions. (For some of the ideas advocated, see right.)

Creative Concepts

From Remarks at Military Creative Problem Solving Seminar

"It appears to me that to get *tomorrow's* job done, we must search with restlessness beyond today's tools, and beyond yesterday's thinking!

"The creative manager encourages and manages varied thinking on the part of his subordinates. He converts differences of professional opinion into imaginative and constructive action. He *thinks* with boldness—*defines* with care; he *evaluates* with thoroughness, and *acts* with imagination. He encourages innovation, and energetically addresses himself to significant responsibilities of today and tomorrow, and the day after."

Colonel W. W. Culp, Commandant, U. S. Army Management School.

"Management can either stimulate or stifle creative effort. Most management groups do some of each. Because good management has to be made up of a high degree of good judgment, managers frequently discourage creativity which involves risk-taking and a high rate of failure. Therefore, if an organization is to have an atmosphere which encourages creativity, the attitude of top management must be favorable, and procedures must clearly indicate that ideas are welcome."

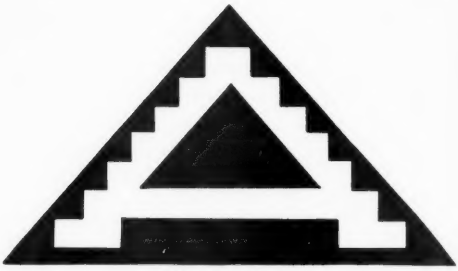
J. S. Anderson, Vice President, General Motors Corporation.

"These are the qualities of the creative executive—a constructive discontent; an ability to observe; an active curiosity; good reasoning power; a well organized mind; a practical and creative imagination; a sense of proportion; an 'I'll show you' attitude; and outside creative interests."

Robert E. Chestnutt, General Electric Company.

Training and maintaining a combat-ready field army is the prime job of the

United



United States Army *In Europe*

General Bruce C. Clarke

THE military defenses of western Europe, under the North Atlantic Treaty Organization, stretch in an immense arc from the northern tip of Norway to the eastern borders of Turkey. The vital sector of this arc—the keystone of European defense — extends from Jutland peninsula to the Alps and from the Iron Curtain to the Atlantic.

It is within this sector and in northern Italy that the United States Army, Europe lives, trains and operates. Here the main elements of America's massive contribution to ground defenses of Europe are concentrated.

This territory is, perhaps, the most valuable piece of real estate in Europe. It contains the mines and factories, the fields, farms, port facilities and waterways, the communications and commercial facilities that, combined with American aid, provided the basis for Western Europe's economic recovery after World War II.

A mere recital of the names of some of the cities found in this area —Munich, Stuttgart, Mannheim, Frankfurt, Nürnberg—known throughout the world for their production of textiles, chemicals, automobiles, aircraft motors, machinery, electric goods, precision instruments, railroad equipment, iron and steel—re-emphasizes the importance of the region.

In Western hands, all these provide assets for the waging of peace, for prosperity and for security. In Communist hands, their loss would mean the collapse and death of Europe.

The position and the mission of USAREUR are clearly defined. Within the framework of NATO, its number one job is to train, equip, and maintain a combat-ready field army on the continent of Europe.

Our paramount concern—as I have said many times and re-emphasize here—is the ground combat soldier. He is the focal point of all our efforts. Organizing, equipping, training, sustaining and supporting him so that he can perform his indispensable role in combat is the Army role. This role is equally significant in any kind of war —hot or cold. It is just as important in general war as in limited war.

Beguiled by the mechanical marvels of the age, it is easy for people to forget the true character of the ground combat soldier's role in war. When free men have been so beguiled in the past, they have slipped back into vassalage.

Seventh U. S. Army

THE very core of United States Army, Europe (USAREUR) is the Seventh Army which, "born at sea, baptized in blood and crowned in glory" fought through France to victory in Germany in World War II, remained for a time as an army of occupation, and was reactivated in 1950 to become the first effective foundation stone in the Free World's wall of defense against Communist aggression.

Throughout the years, Seventh Army has kept pace with advances in tactics and techniques, with constant additions of new weapons and the most modern equipment. So rapid have been these advances—and the effective reorganization to meet modern requirements—that less than four years ago the Seventh Army was able to announce proudly that it had become "the world's first pentomic army."

The American elements of Seventh Army are the two Corps, V and VII, five divisions—3d Infantry, 8th Infantry, 24th Infantry, and the 3d Armored and 4th Armored—the 2d, 11th and 14th Armored Cavalry Regiments, and the 4th Armored Group.

The combat records of both Corps extend back to World War I, in which V Corps operated on the battlefields of Lorraine, St. Mihiel and the Meuse-Argonne, while VII Corps was organized in France a few months before the Armistice. In World War II, the tide of battle carried V Corps from Normandy, Northern France, the Rhineland, Ardennes-Alsace and thus into Central Europe.

The combat records of the three infantry and two armored divisions forming Seventh Army's basic ground forces are equally impressive. In Europe and in the Far East the records

General Bruce C. Clarke
Commanding General
United States Army, Europe

Tanks of 14th Armored Cavalry maneuver through narrow streets of small town during one of frequent field exercises in command area of U. S. Army Europe.

run from Normandy to Sicily, from New Guinea to Korea. They have a fighting tradition and the esprit de corps that is an ever-present stimulus to always greater accomplishment.

The United States Army, Europe trains and studies constantly. Tactical training runs the gamut from qualification in individual weapons to participation in large-scale, multi-national NATO field exercises. And the fact that USAREUR's role in the defense of Europe entails efficient operation not only as a national military organization but also in partnership with our allied companions in arms, sets up additional problems in the field of inter-allied military relations.

Not only is the United States Army, Europe almost constantly in the field; it can also be said to be almost constantly in the military classroom. Much technical training is needed to produce the specialists needed by today's Army in electronics, special weapons, modern supply techniques, and intelligence. This training is provided by a USAREUR-operated service school.

Command Structure

TO explain USAREUR's position in relation to the national defense organization and to its mission with NATO, it is necessary to show something of the interlocking nature of our command structure. Since there is a unified United States Command in Europe which groups all U. S. Armed Forces here under one commander, USAREUR—like its sister services, the United States Air Forces

in Europe, and the United States Naval Forces—reports to the United States European Command (USEUCOM).

But on matters of administration and supply, USAREUR reports directly to the U. S. Department of the Army. (It is worthy of note here that, under NATO agreements, each nation is responsible for the logistic support of its military forces.)

DIRECTING all of USAREUR's activities in the three countries in which its troops are located—West Germany, France and Italy—is the Commander in Chief (CINCUSAREUR) and his staff at headquarters in Heidelberg, Germany. The standard organization of a major headquarters is used, comprising a general staff, a special staff, and specialized agencies, totaling more than a score in all. In order to achieve both maximum efficiency and maximum economy, all headquarters elements are not located in one place, but rather where they may perform their operations to the best advantage.

Major Commands

ONE of the axioms of good management procedure is that in order to manage effectively, the limitations of the "span of control" must be recognized. There is a limit to the number of activities that an individual can direct personally and still achieve effective results.

In line with this theory, CINCUSAREUR therefore requires only six major commands to report directly to him. In addition to the Seventh Army already described, these are: the Berlin Command, Northern and Southern Area Commands, the U. S. Army, Europe (Rear)/Communications Zone, and the U. S. Army Southern European Task Force.

Berlin Command comprises the U. S. Sector of the divided city. Our military personnel there represent the only U. S. Occupation Force still in existence as a result of World War II.

Northern and Southern Area Commands. In Germany, USAREUR's area of operations is divided into area commands—Northern and Southern. Each of these area commands pro-

In an address before the Frankfurt Women's Club, General Bruce C. Clarke, Commander in Chief, United States Army Europe, suggests some steps for

Easing the Gold Flow Problem

IN accordance with presidential directives to stem the flow of gold, I have issued orders to all commanders that USAREUR facilities can no longer be used by vendors of foreign goods. . . .

In my judgment, our overseas American Women's Clubs can and should play a key role in the resolution of the balance of payments deficit. It is important, and we all should take vigorous steps within our capabilities to curtail the gold flow.

We are not required to lead Spartan lives, but we must each seek means to reduce our overseas expenditures. . . . I suggest that most of us can accomplish this by watching closely our purchases of luxury items not necessary to our health or welfare.

Aside from careful monitoring of local economy purchases, we can help

vices administrative and logistical support for all U. S. Army personnel within its borders, with the exception of medical services, which are provided for the most part by units assigned to a U. S. Army Hospital Center.

Communications Zone. During the first six post-war years, U. S. forces in Europe were supplied mainly through the north German port of Bremerhaven. During those years when the threat of Communist expansion had not become fully apparent, the fact that this line of communication from the North Sea to Bavaria ran parallel to the front of a potential aggressor was deemed of small importance. The growing threat of invasion from east of the Iron Curtain, the buildup of East German and satellite forces, the blustering attitude of the Kremlin, and overt operations such as the blockade of Berlin, made painfully obvious the need to establish supply lines far less vulnerable to direct attack. Thus a new Communications Zone—third in the generation of COM Z's—was brought into being.

An agreement, worked out in six months of delicate negotiations with our NATO ally, France, permitted the use of port facilities, storage depots, space for more depots, and transportation rights on French roads and rail lines to West Germany.

For nearly five years COM Z personnel built, improved facilities, and expanded their capabilities until, by mid-1956, they were able to assume the full burden of logistical support for USAREUR. The responsibilities of COM Z were then extended to include the operation of supply installations in the German Federal Republic. In 1959, more and more of USAREUR's technical service activities and divisions were being shifted to the control of the Commanding General of COM Z.

The operation of a supply system as complex as this involves, first of all, skilled manpower, and second, efficient organization. Today this Communications Zone has two major elements—Theater Army Support Command and Port Area Command.

There are, in addition, two special

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slow the flow of gold by exercising care in the use of our utilities. Wasting gas, water, and electricity is always frowned upon in efficient households. Now, such waste of our utilities will directly contribute to the gold flow, since the dollars which pay for utilities go into the economy of the host nation. The money saved by those in government quarters can be used for other essential improvements.

I am certain there is one question which arises in the minds of all: "How does this program affect my family vacation plans?" I believe that trips and vacations are necessary for your health and cultural development —it is not our intention to suggest any severe limitations. Rather, we do suggest that you make maximum use of our Armed Forces recreational facilities and that you budget your trips carefully so as to keep within the spirit of our savings program.

I realize that the admonition to decrease or limit spending on the economy by various amounts per person per year is putting the accent on the negative. It is better to stress the positive.

INVEST in U. S. Savings Bonds, or if your husband is a member of the Armed Forces he can use soldier, sailor, or airman deposits. You serve your country and yourself. Put your savings in any Stateside investment or savings account. Thus, you will not only help to stem the gold outflow, but you build security for yourself.

Two soldiers of West German Army hold an outpost during a winter exercise staged with NATO troops.

commands with responsibilities peculiar to themselves—the Orleans Area Command, which supports the COM Z headquarters at Orleans, and the Seine Area Command, which supports the U. S. EUCOM headquarters and the United States elements of the Supreme Headquarters, Allied Powers, Europe. Completing the structural framework of the Communications Zone are its four posts —Poitiers, Bussac, Toul and Verdun.

Port Area Command personnel receive incoming supplies through the French ports, and store and maintain them in widely dispersed depots in rear areas. Theater Army Support Command personnel operate forward depots in France and West Germany, drawing their supplies from Port Area Command and providing direct support to elements located in forward areas. (It must be noted that the historic Port of Embarkation at Bremmerhaven, Germany, is under the direct control of COM Z, rather than that of the Port Area Command.)

The U. S. Southern European Task Force located south of the Alps, in Italy, is another major element of USAREUR. Activated on 25 October 1955, SETAF is unique among U. S. Armed Forces in that its primary reason for existence is *the support of the land forces of another nation.* It is, first and foremost, a missile command designed to support, in time of war, the ground forces of Italy.

Three distinctive conditions apply to this organization—geographical, military, and administrative. Militarily and geographically, it is a member of the SHAPE (NATO) team, reporting to Allied Land Forces, Southern Europe (LANDSOUTH) and in time of war it would immediately become a LANDSOUTH element. As a member of the USAREUR team, however, SETAF reports to CINCUSAREUR on U.S. Army Command and administrative matters.

USAREUR NATO Role

THE relationship of the United States Army, Europe with our allies in NATO is a relationship based on treaties and working agreements dating back to the inception of NATO.

Armored unit troops engage in practice with 3.5-inch rocket launcher during winter maneuver in West Germany.

USAREUR is America's contribution—in being—to the land strength of the NATO Alliance. This contribution comprises at least one-sixth of the ground forces regarded by General Lauris Norstad, the Supreme Allied Commander, Europe, as necessary for the defense of western Europe. This force is committed to NATO.

In the event of aggression—or to speak bluntly war—the Supreme Allied Commander Europe (SACEUR) takes over control of the allied forces. SACEUR has under him four major commands. They are: Allied Forces Northern Europe (AFNORTH), Allied Forces Central Europe (AFCENT), Allied Forces Southern Europe (AFSOUTH), and Allied Forces

Maintaining a constant state of battle readiness, Seventh Army troops train on a year around basis, as this group is doing in workout with a recoilless rifle.

SETAF troops ready Honest John missile as part of support mission to ground forces of Italy.

Mediterranean (AFMED).

The headquarters of the Allied Forces Central Europe are at Fontainebleau, France. Under this command come the Allied Land Forces, Central Europe, divided into the Northern Army Group and Central Army Group — NORTHAG and CENTAG.

It is with CENTAG, this Central Army Group, that we are now concerned, for the Commander in Chief USAREUR is also the Commander of the Central Army Group. His headquarters is in Heidelberg—almost at the geographical center of the area of USAREUR's responsibility. Incidentally, to illustrate the international quality of the command, it is significant that AFCENT is commanded by a French General, LANDCENT by a German General, and CENTAG by an American General.

The Central Army Group comprises German, French, and American elements, training together, working together, exercising together, and together developing a smoothly operating machine which is slowly but surely reaching a peak of combat efficiency by any standards.

In time of war, CENTAG would embrace three major commands—Seventh Army, First French Army, and II and III German Corps.

Allied Elements

BECAUSE of the amazing advances of the German elements within the NATO organization, it may be well to describe further their organization and training, side by side with our American divisions.

When the German Federal Republic became a sovereign state in 1955, she had not even the nucleus of an armed force, nor the means of arming, equipping or training such a force. Within the space of less than six years, she has brought into being seven divisions which are now assigned to NATO.

The German divisions working with us are: The 2d Armored Infantry, the 4th Armored Infantry, the 5th Panzer Grenadier Division, and one Mountain Division. In addition, there is a German airborne brigade.

This is the army of a democracy. Its duties and responsibilities are clearly defined, both in the international agreements surrounding Germany's adherence to NATO, and in the laws of the German Federal Republic. Germany looks to her legitimate defense requirements entirely within the multinational structure of the Atlantic Alliance. Her army contributes substantially not only to German defense but to Allied defense as a whole.

The relationship between the German and American components of CENTAG has been cordial, understanding and, from a training standpoint, highly successful. The German soldier himself is dignified, imbued with a sense of responsibility, responsive to command, and devoted to this task.

The French elements over which CENTAG has command are less in evidence than the Germans, and for sufficient reason. France, engaged in a long and painful Algerian war, had been forced, very early in the history of NATO, to withdraw some of her strongest fighting forces to North Africa. Her remaining forces, however, are very much in the picture and, in the event of war, would definitely be brought to the full strength of her commitment.

The presence of our American troops in Germany and France has, of course, brought its problems of community relations. But it can be said that, through the years, and despite "incidents" that from time to time have resulted in local disturbances, the relationship between the American fighting man and the citizens of our host countries has been one of friendship, understanding and comradeship—an amazing phenomenon when one considers the years of transition from war, to occupation and to partnership in defense.

Seventh Army's heavy punch is typified by Corporal poised against background of an Honest John and 280mm cannon.

Ten years
and three hundred episodes later—

"The Big Picture"

Keeps the Army in Focus

Master Sergeant Neil S. Robinson

WITH ten years of experience and some 300 episodes to its credit, the producers of the Army television series, "*The Big Picture*," are not resting on past accomplishments; rather, like all creative artists, the writers, cameramen and producers of this documentary series are blazing new paths in areas where there is no precedent to guide them.

Aided and abetted by the Office of the Chief of Information and its Tele-radio Branch where *The Big Picture* is produced, writers and project officers now are in the field searching for new and timely topics. They are making every effort to be far enough ahead of the news to be newsworthy when events break.

In the Far Pacific and in the Near East, material is being gathered on trouble spots of the world where independent nations face an enemy seeking to take over by covert or open aggression. Through future *Big Pictures,* American audiences will visit these danger areas and meet the people who hold the line on a perilous frontier.

At the same time, producers of the documentary television series are hard at work creating new programs that

MASTER SERGEANT NEIL S. ROBINSON is Broadcast Specialist with "The Big Picture," Television Section, Tele-radio Branch, Troop Information Support Unit, Office of the Chief of Information, Department of the Army.

depict the efforts of military agencies in their constant search for new weapons, equipment and teaching techniques. New frontiers in medicine also are being explored.

Two forthcoming productions of *The Big Picture* develop the theme of the increasing importance of medicine. "The Army Nurse" depicts a branch of the service that all too often performs its mission without the praise that is due.

"Mouth to Mouth Resuscitation" is another example of the way in which health topics are brought to the attention of the public. This has been described as a noteworthy contribution of an educational nature to the medium of television.

In the area of research and development, latest military concepts are examined in upcoming programs. Covering every department — men, weapons, equipment, food, clothing— in which the U. S. Army is constantly at work, at least one episode soon will be released to bring to American viewers the forward look of military thinking and planning.

All in all, more than 30 subjects now are on the "production board." These range from "Broken Ridge," starring Medal of Honor winner Audie Murphy, to "What's Their Line," highlighting American soldiers with unusual occupations world-wide.

Behind the Scenes

THIRTY-NINE productions a year are conceived, written and produced for world-wide viewing. All of this means production on a big scale, and it takes the operation of a production center geared to big business to handle the load.

This is accomplished at the Army Pictorial Center, Long Island City, New York. It is there, on a giant sound stage, that *The Big Picture* comes to life. When completed, 120 prints of each television film presentation are distributed throughout the United States to more than 300 TV stations and to TV networks of the

Prior to setting up and shooting a new production, representatives of technical branches involved confer to iron out last-minute details.

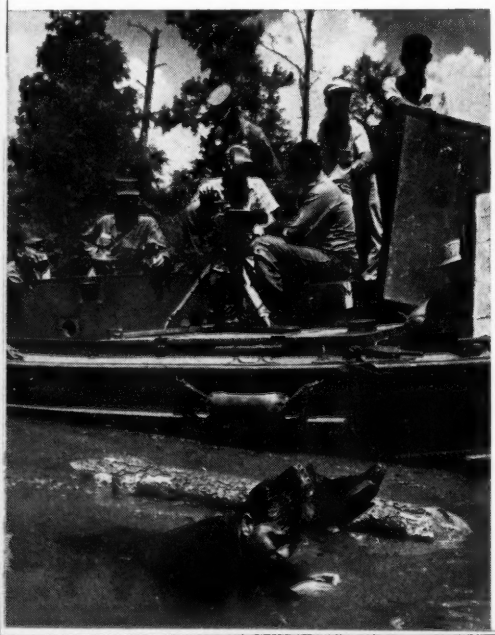
Raymond Massey, narrator, confers with producer of the 1959 award winning "Eisenhower Story."

Armed Forces Radio and Television Service overseas.

While civilian production crews are shooting "live" under direction of military producers on the Pictorial Center main stage, many millions of feet of combat stock footage are available from storage to be integrated into any particular production. Editors, sound men, music mixers add their skills and pass the episode along. Professional narrators come from New York City to provide background commentaries for certain presentations. Such "big names" as Walter Cronkite, Alexander Scourby, Ronald Reagan, Lowell Thomas, Sheppard Strudwick and Edward R. Murrow, formerly with CBS, are heard as narrators on *The Big Picture.*

Finally, all the strands of the picture are woven into one complete unit in the mixing room. This is the nerve center of a vast complex connected by patch panels and cables. Engineers sit at a giant console, twirling knobs to blend multiple effects until the production is complete. Objective: one completed *Big Picture* every ten days. The completed "answer print" is shipped to the Pentagon where representatives from the Department of Defense, Army and other interested agencies give final approval.

Although television production is a relatively new medium, *The Big Picture* has a tradition to look back upon. Production teams at the Army Pictorial Center are working in the shadows of past great film stars, for prior to World War II this was the Paramount Motion Picture Studio. Across the main stage that now holds the sets



Camera crew on location at Fort Benning shoots a scene for training film on escape and evasion techniques.

f *The Big Picture* have moved many of these stars—Valentino, Gloria Swanson, Gary Cooper, Walter Huston and other screen immortals.

Many of these same film greats continued working at the Pictorial Center when its facilities were used to make Army training films. Adolph Zukor and Robert Capra were among the directors who stepped into uniform during World War II. John Huston directed one of the all-time great *Big Pictures*—"The Battle of San Pietro," which rests in the files bearing the simple title TV-340, but is often sought out as one of the great American documentaries of our time.

Big Picture releases have won Freedoms Foundation awards for three consecutive years—"Operation Mercy" in 1957, "Ottumwa USA" in 1958, and three episodes, "People to People," "A Debt is Honored" and "The Eisenhower Story" in 1959.

With its smooth-working staff adding variety, interest and depth to the Nation's television screens, the Office of the Chief of Information, Department of the Army, may be justifiably proud of its ten-year-old documentary television series. Year after year it continues to bring an accurate and interesting report on the Army to the American people, gathering many prize awards as it goes along. While the screens of the viewers in their living rooms may be small, *The Big Picture* tells a big story.

A Communist prisoner of war compound is reproduced for training film dealing with Code of Conduct.

Director John Huston's creation of "The Unforgiven," a documentary about the Battle of San Pietro in World War II, remains a classic among such productions.

The Assistant Chief of Staff for Intelligence reports on

Soviet

Military Developments

Major General John M. Willems

FAR-REACHING changes are taking place in the structure of the Soviet Armed Forces. These result primarily from an accelerated adaptation of these forces to new military technology, including nuclear weapons and missiles.

In January 1960, Premier Khrushchev announced a program for alteration of the structure and modernization of the Soviet Armed Forces and a concurrent reduction in strength from about 3.6 to about 2.5 million men. The plan, as Mr. Khrushchev described it, emphasizes trends already observed. A cut in naval surface vessels would increase the prominence already given to submarines; and a reduction of aircraft would bring missiles of all ranges further to the forefront. A cut in ground forces would mean additional reliance on a modernized mobilization system.

With regard to their ground forces, the critical figure for the Soviets is not the number of their active divisions, but the number of divisions fully equipped and manned by trained personnel that can be put into the field in the first month or two of mobilization. For this purpose, the Soviets are expected to retain a capability for rapid mobilization of substantial trained reserves.

From a presentation before the House Armed Services Committee, February 1961.

New Rocket Command

IN conjunction with the Soviet modernization plan, an organizational change has been made in the Soviet high command structure. A new rocket command, announced in May 1960, establishes the missile arm

as one of the five main directorates of the Ministry of Defense, one each to administer the following force components: ground, air, air defense, naval, and rocket forces. These directorates are concerned with the organization, doctrine, logistic, and other administrative requirements of their respective components.

According to Soviet statements, the commander-in-chief of rocket troops is in the direct chain of operational command. The overall direction of major commands and separate forces in the field is exercised by the Minister of Defense through the General Staff of the Soviet Army and Navy.

Military Capabilities

FOR purposes of examining Soviet military capabilities, we have categorized the types of military operations under these three headings: intercontinental attack; air and missile defense; and ground warfare.

At present, the principal Soviet instrument for intercontinental attack is Soviet Long Range Aviation. Although the numbers of Soviet bombers is expected to diminish in the next few years, there will continue to be a manned bomber capability which is of concern to the United States for the foreseeable future.

Ballistic missiles—ICBMs, IRBMs, and submarine-launched missiles—are, of course, assuming increasing importance as intercontinental nuclear weapons delivery vehicles. The threat which they represent will grow.

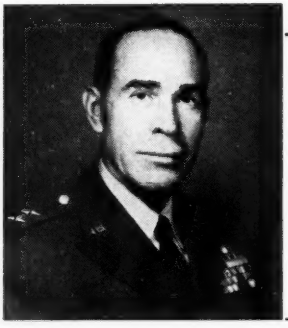
Soviet air and missile defense have long held a high priority in Soviet military programs. Air defense capabilities are being improved rapidly, primarily through wider application of surface-to-air missile systems. Improved fighter aircraft are also being developed and placed in operational units throughout the USSR and the European satellites. Although the number of air defense fighters in operational units is expected to diminish, the overall Soviet air defense capability will increase.

To date, the Soviets have deployed two generations of surface-to-air missiles. The first of these, which has been operational for over six years, is deployed around Moscow in a dense and costly complex. Now a new system, designed for static or mobile employment, has been widely deployed.

We believe the Soviets have a research and development anti-ballistic-missile missile program underway. Aside from the obvious psychological and political advantages the USSR would gain from deploying such a system first, the Soviet leaders apparently believe they will accrue major military advantages through protection of selected areas and forces, and through complicating the planning task of any potential antagonist.

Ground Forces

THE primary forces available for



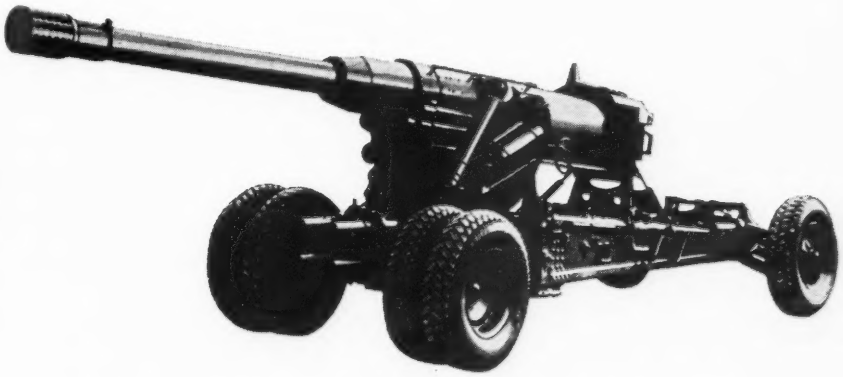
Major General John M. Willems
Assistant Chief of Staff for Intelligence
Department of the Army

campaigns in Eurasia would be highly integrated ground and tactical air forces of the Soviet Army. Currently, the Soviets maintain over 150 line divisions in their standing forces, about two-thirds of which are combat ready, although not at full strength. The remainder are at cadre strength. In addition to the line divisions, there are numerous surface-to-air and surface-to-surface missile units; artillery divisions; and separate artillery, antiaircraft artillery, and antitank brigades and regiments.

Traditionally, the Soviets have emphasized the artillery arm. Stalin, himself, called it "the god of war." And, despite the priority currently given to missiles in the ground forces, the USSR is continuing to develop and manufacture modern, conventional artillery weapons. The heavier caliber weapons, at least, could be dual capable—that is, suitable for firing either nuclear or non-nuclear projectiles.

Examples of some of the modern artillery weapons introduced by the Soviets since World War II are a 203mm gun-howitzer on a one-piece mount, with a maximum range of 32,000 yards; a 240mm mortar capable of 10,000 yards maximum range; and a twin 57mm self-propelled antiaircraft mount. I should like to emphasize that these and all other items of ground force equipment discussed in this presentation are already in the hands of troops, in quantity.

Although the numbers of combat aircraft in Tactical Aviation of the Soviet Army are being reduced, we expect the fighters and bombers of this arm to continue to be an important source of close support for ground elements. Fighter units are trained in ground attack techniques, in addition to air defense. Bomber units are trained in ground support bombing.



Traditionally the Soviets have emphasized the artillery arm. The USSR is continuing to develop and manufacture modern, conventional artillery weapons.

The Soviet Army has organic to it light and medium transport aircraft and helicopters which are assigned to support of Airborne Troops. In addition, Tactical Aviation and Soviet tactical ground units include small helicopters and fixed wing aircraft. A few examples of aircraft available

The main battle tank, the T-54, weighs 40 tons, mounts a 100mm gun, has a cruising range of 250 miles.

for support of ground units are:

A new transport aircraft called the CAT. A civil air fleet version, it can land on relatively rough strips and can carry 125 combat-equipped troops.

The military version of the CAT, called the CUB. It has a redesigned tail section so as to include a rear loading ramp. It can carry about 90 troops.

A military transport called the CAMP, designed specifically for military use. It has a rear loading ramp and can lift 60 troops.

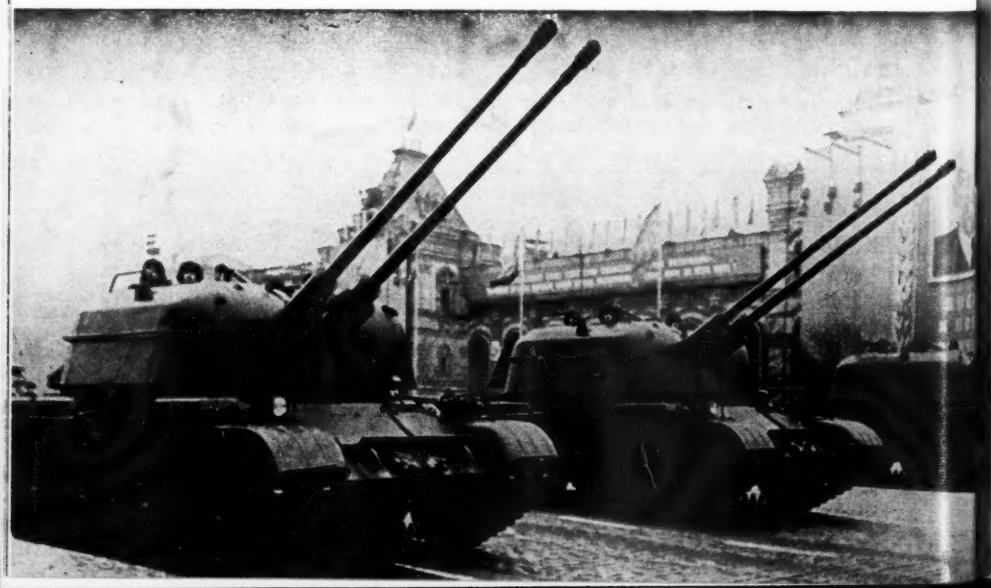
A new, standard, heavy transport helicopter, nicknamed the HORSE. This aircraft has a payload capacity of 8,800 pounds, or 40 combat-equipped infantrymen.

Mechanization Trends

WE continue to observe a trend toward mechanization in Soviet ground forces. This trend is indicated, not only by weapons development and production, but also by the gradual elimination of rifle divisions, primarily in favor of highly mechanized, motorized rifle divisions which move wholly on tracks and wheels, and which, in fact, are light armored divisions.

The Soviets value armor not only for its shock effect, but also for its speed and surprise capability and the protection afforded against nuclear weapons effects. Examples of their tanks are the T-54 and T-10. The 40-ton T-54 is the main battle tank of the Soviet Army. It mounts a 100mm gun and has a cruising range of 250 miles. The T-10, the current standard Soviet heavy tank, mounts a 122mm

Twin 57mm self-propelled antiaircraft mount is typical of emphasis placed by Soviets on producing modern artillery weapons.



gun. It weighs more than fifty tons.

Modern Soviet equipment might be employed in the following manner: The initial Soviet Army tactical forces in an attack would most likely consist of reconnaissance elements, equipped with amphibious light tanks, armored personnel carriers, and short-range rocket mounts. The light tanks have a 76mm gun. They would be accompanied by infantry in amphibious personnel carriers. Heavier fire support in the form of high explosive or nuclear fires would be delivered by tracked, self-propelled rockets. Significantly, these three vehicles employ a common amphibious chassis.

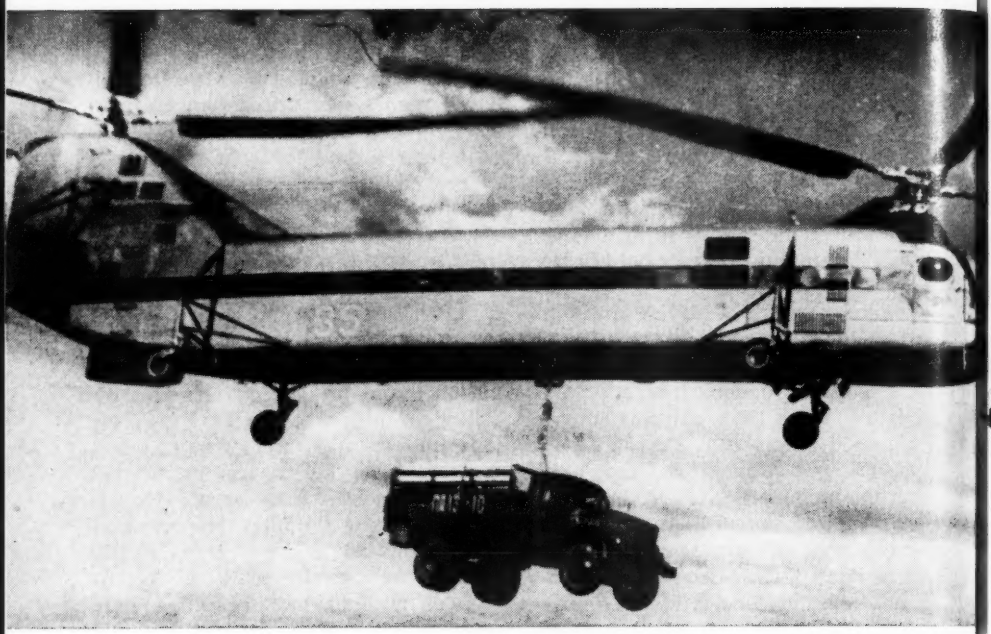
If the opposition proved too much for this reconnaissance group, additional support might take one, or a combination of forms. The Soviet commander might decide to do no more than provide additional firepower through the use of other, longer-range, unguided rockets at his disposal. They could deliver either nuclear or non-nuclear warheads on relatively deep objectives. Self-propelled multiple rocket launchers could take targets under fire at typical artillery support ranges.

In their second post-war generation of rocket launchers, we observed the transition from truck-mounted launchers to full-tracked launchers—another indication of the Soviet concern for mobility. These launchers give Soviet commanders tremendous firepower.

Additional armored shock action and firepower can be quickly furnished initial bridgehead elements by follow-up units with the T-54 medium tank and the T-10 heavy tank, using temporary snorkel devices to "wade" water obstacles. They would be accompanied by infantry in armored amphibious carriers.

Airborne assault elements, accompanied by light mobile fire support weapons, would also be used to seize objectives and bypass opposition. They could use helicopters of the

The Soviets' 100mm field gun, the M55, is shown here towed by an armored artillery tractor.

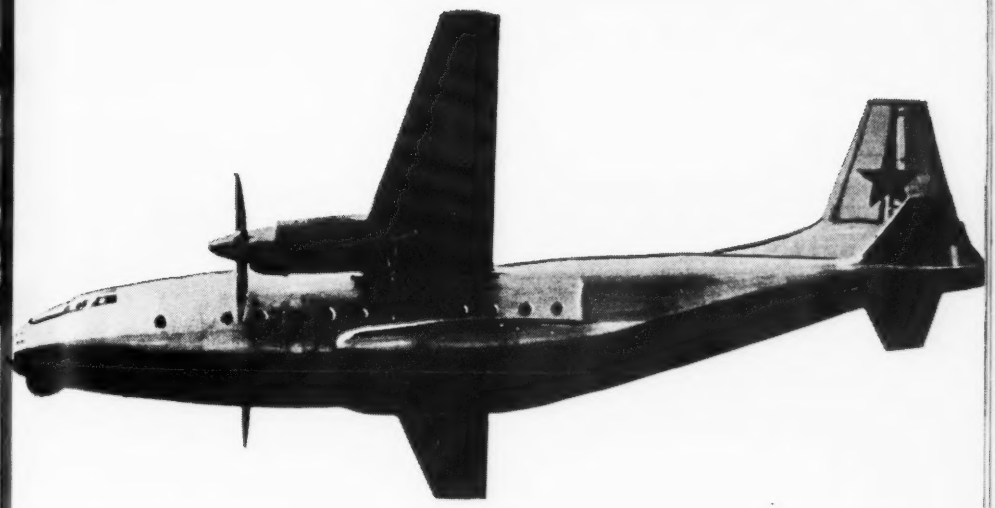


New standard medium transport helicopter, the HORSE, has a payload capacity of 8,800 pounds or 40 troops.

types already discussed, as well as others. Soviet forces habitually employ helicopters on field maneuvers in a variety of roles.

As you know, the Soviets have a family of surface-to-surface ballistic missiles of short and medium range in addition to the unguided rockets mentioned earlier. The Soviets have displayed several types in the Moscow

The CUB is a military version of a new civil aircraft called the CAT. With a redesigned tail section to include loading ramp, it can carry ninety men.



The CAMP is a transport aircraft designed specifically for military use. Featuring a rear loading ramp, it has capacity to airlift sixty troops.

parades of recent years, including both short and mid-range weapons. Some of these missiles have been operational for five years or more.

With regard to logistic capabilities, the Soviets maintain hundreds of munitions and other military storage sites throughout the Soviet Union. It is quite apparent that the Soviets could wage war for long periods without necessarily depending upon a quick re-supply of munitions from their industrial base.

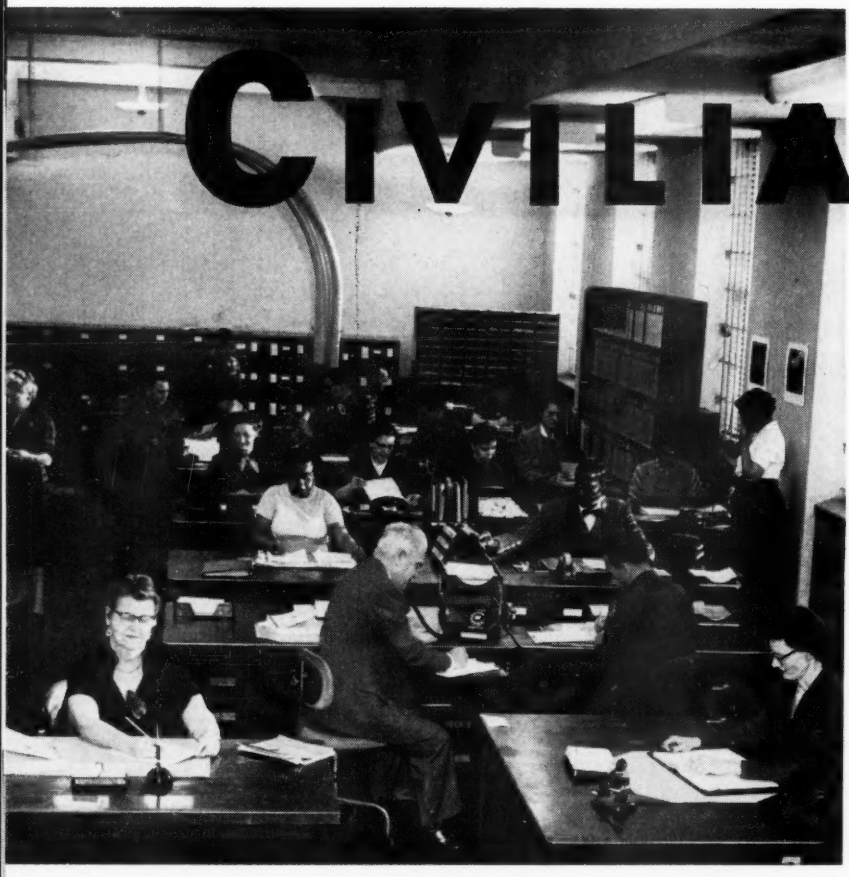
Present Outlook

WE believe that in the present Soviet view, both sides are deterred from the deliberate initiation of general nuclear war as a rational course of action. Nevertheless, the Soviets obviously have substantial capabilities for such a war. A more likely threat, in our view, is Soviet or Soviet-inspired and supported subversion and Soviet-inspired and supported limited aggression under the umbrella of nuclear stalemate.

The Soviet leaders today view the future with confidence. They can be expected to continue their struggle for world supremacy over the full range of human activity. Wherever the Communists' probings uncover weaknesses, they are quick to exploit the opportunity afforded them. This, of course, includes any military weakness they may uncover.

Diversified skills, crafts, talents plus loyalty and imagination are vital elements in

CIVILIAN



Charles F. Mullaly

THE United States Army is one of the Nation's major employers of civilian manpower as well as its largest user of military personnel. Only the Post Office Department with 570,000 employees, and, so far as is known, only one of the giant industrial corporations, General Motors with over 550,000 employees, exceeds the Army as an employer.

In all, about 473,000 civilians work for the Army. Approximately 331,000 are U. S. citizens employed in continental United States. About 12,000 U. S. citizen employees work in overseas commands. Included in this

SUPPORT

For the Modern Army

group are almost 3,000 school teachers responsible for the education of 66,000 school-age children of Army personnel stationed overseas. The remainder of the U. S. citizen employees overseas contribute needed administrative and clerical support where technical and managerial leadership, security, or U. S. Government representation requirements preclude employment of local nationals.

The Army's local national workforce overseas performs diverse administrative and maintenance functions. Almost 130,000 strong, it consists primarily of German, French, Italian, Japanese, Korean nationals.

Numbers alone, however, do not tell the story of Army's civilian support force. In terms of variety of occupations, technical and creative competence, and geographic dispersion, the Army's civilian workforce is among the foremost in the Nation. The variety of Army functions employing civilians requires some 1200 separate occupations ranging from atomic science to typing, from common labor to cartography. Many of the specialized occupations actually have no direct counterpart in civilian industry.

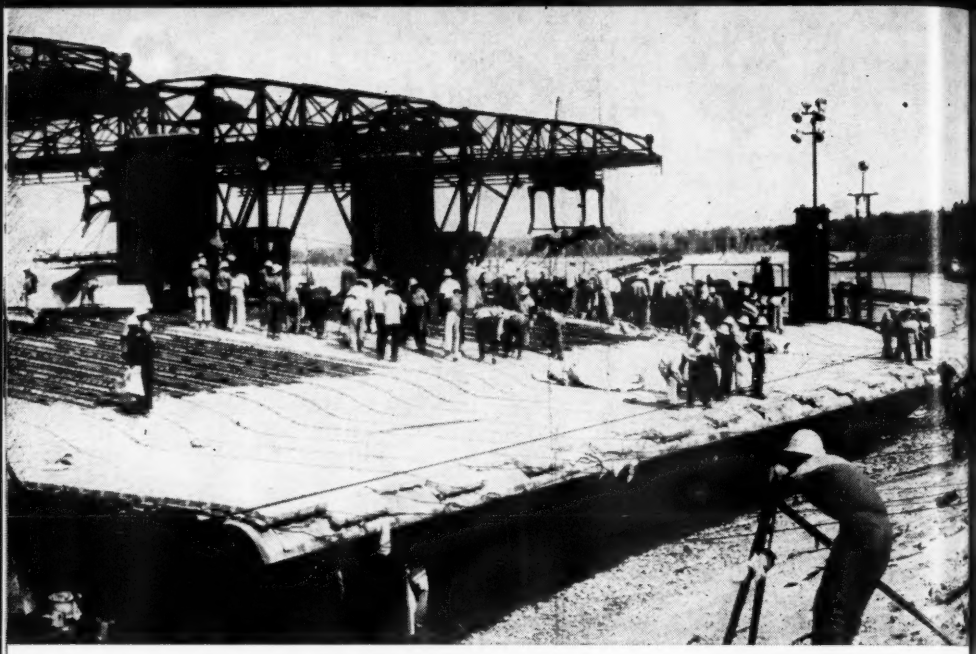
About 45 percent of Army employees work in the crafts and skilled trades, or as laborers in the so called "blue collar" jobs. The other 55 percent work in clerical, administrative, technical and professional "white collar" jobs.

Included in this workforce are some 20,000 scientists and engineers, probably the largest professional staff in the Nation; approximately 30,000 civil works employees who provide 99 percent of the manpower which operates and maintains the inland waterways, rivers, dams and harbors projects that are the responsibility of the Corps of Engineers; and the thousands of procurement, storage and issue experts primarily responsible for the vast logistics operations.

CHARLES F. MULLALY is Director of Civilian Personnel, Office of the Deputy Chief of Staff for Personnel, Department of the Army.

Support Through Diversity

WHY does the Army have such a large and diverse civilian workforce?



Among tasks performed by Corps of Engineers civil works employees, building of articulated concrete runways on Mississippi contributes to national welfare.

The answer lies partly in the economic and political policies of our Nation—the desire to maintain a relatively small standing Army in peacetime. Certainly the extensive utilization of civilians in non-military support missions results in a higher proportion of the Army's military strength assigned to its combat units.

The answer is also partly due to the staffing requirements of industrial-type support functions. In general, these functions rely heavily upon skills and trades common to industrial activities. Looking outside the military force for already trained manpower is a practical and economical solution to the staffing problem.

Perhaps tradition, too, is part of the answer. The Army practice of utilizing civilian manpower in non-military jobs is nothing new; it dates back to the Revolutionary War when civilian rifle-makers and quartermasters were employed by the Continental Army.

Today's civilian workforce is the backbone of the Army's administrative, clerical, post maintenance, scientific and engineering activities. It exists only to support the military functions, and its job is to furnish as efficient non-military support as is possible.

The growing attention to the role of civilian employees within the Army and to the management and contributions of civilians is not the result of efforts to "civilianize" the Army. Rather, it is the logical result of the vastly increased requirements for efficient support of the modern combat Army.

New tactics, equipment and organization require new production techniques and accounting procedures, better methods for processing necessary paper work, and a steady stream of scientific developments. Unless the technical, clerical and administrative support elements can keep pace with combat elements, the Army cannot meet the challenges of the cold war as efficiently as it must.

These new support methods and techniques demand higher quality civilian skills just as new tactics and organizations demand higher quality military skills. Electronic data processing equipment which has revolutionized the maintenance of supply, fiscal and personnel records cannot be operated with the old clerical skills.

Nike systems cannot be maintained by men who know World War II or even Korean vintage antiaircraft systems. The programs to attract, motivate and retain employees with the skills and in the quantities needed by the modern Army are worthy of the attention they are receiving.

DISTRIBUTION OF CIVILIAN STRENGTH BY MISSION

Organization or Activity	*Percent*
Storage, Repair and Issue	24
Housing and Training of Troops	21
HQ and Subordinate HQ	15
Research and Development	10
Engineer Districts	9
Manufacturing Activities	8
Procurement, Inspection and Testing	4
Fiscal and Administrative	3
Army Terminals	2
General Hospitals	1
Other	3

Outstanding Service

WHAT kinds of people make up the civilian element of the Army? As with any large group, no generalization would be completely valid. Some observations, however, may be sufficiently valid to be worthwhile.

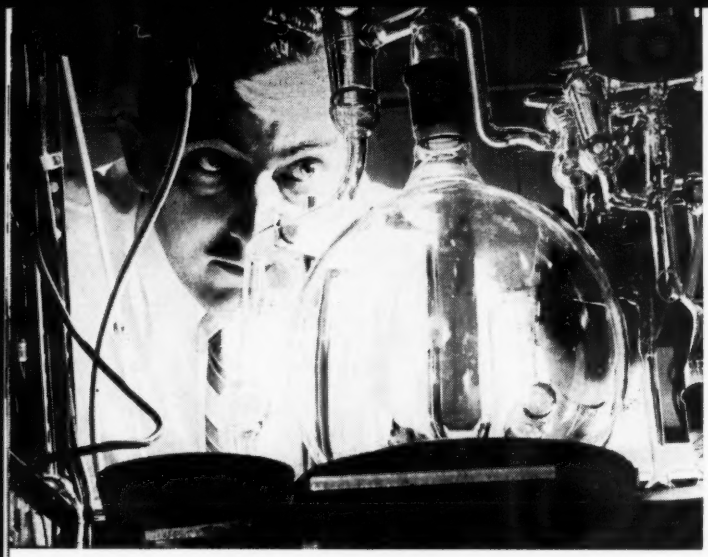
By its very nature, Army support operations generally require large fixed plant and equipment investments. Employees generally are drawn from the surrounding geographical area, where they often have close family and social ties with the local community. Many also are long-time employees of one activity and have a strong loyalty and allegiance to it; consequently their view of the Army may in many cases be more limited than that of their military associates.

These characteristics may make for different outlooks and interests but not for a different degree of loyalty, devotion, and desire to contribute to the Army. Certainly those members of the workforce who have received major Army awards are a select group. Yet the range and scope of their contributions helps to illustrate both the functions and the service of the civilian element.

Five young Army scientists—Thomas A. Prugh, Mrs. Edith M. Olson, Norman J. Doctor, James R. Nall, and Dr. Jay W. Lathrop of the Diamond Ordnance Fuze Laboratories—recently developed and patented a photolithographic process for manufacturing miniature electronic circuits. This technique, hailed as a major breakthrough in the microminiaturization field, made possible the mass production of electronic equipment from one-fifth to one-seventh smaller and lighter than that previously used in fuzes and missile guidance systems.

This Army team of two electronics scientists, a physicist, a chemist and a mechanical engineer combined their talents to solve one of the problems brought on by the modern Army's need for light, mobile equipment. In solving this problem, they also made a major contribution to the electronics industry, since the process has wide application in non-military equipment, too; and because they are Federal employees, their patent is in the public domain.

At the 1960 Secretary of the Army Awards Ceremony, two employees were awarded the Decoration for Exceptional Civilian Service for bravery. This—the highest honor the Army can bestow on an employee—was awarded to Richard Ragle of U. S. Army Snow, Ice and Permafrost Establish-



A mass spectrometer is carefully checked by chemist at Fort Belvoir before it is used in laboratories.

ment, and to Billy Hale of the U. S. Army Interagency Communications Agency. Ragle organized and directed the rescue of 13 military and civilian personnel from a crashed aircraft on the Greenland Icecap. He drove a weasel for 44 hours over uncharted ice to accomplish the rescue. Hale voluntarily risked his life to rescue five workmen who had been overcome by carbon monoxide gas.

Miss Jean Gunderson of Ordnance Weapons Command was among those honored for outstanding suggestions at the ceremony. In the course of her work as a production specialist she recognized that the fuze for one type mine, being declared surplus, could be used with a still-current anti-personnel practice mine. The idea resulted in savings of almost one half million dollars. Applying imagination to an everyday situation is one of the characteristics of highly motivated, productive employees.

Army civilian researchers have played an important role in contributions to medical research. For example, Dr. Donald E. Gregg, Chief of Cardiorespiratory Diseases, Walter Reed Army Institute of Research, is generally recognized as one of the world's foremost physiologists. He has published more than 80 physiological reviews and original papers and some 50 other papers for presentation to professional societies. Invitations to lecture have taken him to meetings, symposia and medical schools throughout the world. Among his major research contributions are several blood flow and pressure meters which have greatly improved methods of physiological investigations.

New ideas for better ways of doing the Army's support job are not confined to research or hardware areas. The new Army Functional File System was the idea of Gardner Davis, Jr., of Headquarters, USAREUR,

DISTRIBUTION OF CIVILIAN EMPLOYEES BY SELECTED MAJOR OCCUPATIONS

Clerical and Administrative	131,000
Skilled Trades and Crafts	111,000
Procurement, Inspection, Storage and Transportation	48,000
Engineering and Technical	27,000
Laborer and Custodial	10,000
Physical Science and Technical	5,000
Medical and Biological	5,000
Mathematics and Statistics	3,000

working in cooperation with one of his military associates. This system completely changed the concept and operation of records filing and retirement systems. Its benefits are almost staggering in scope, considering the enormous number of records needed to operate the Army's vast enterprise.

These are some of the kinds of people who make up the Army's civilian workforce.

Among over 400,000 individuals there are certain to be wide variations in capability, dedication and output—as would be true of any large unit. The fact that this particular group performs vital functions in support of Army missions makes it imperative that employment practices and leadership elicit the best and highest quality service.

Under such leadership it can be expected that the workforce will include a growing proportion of exceptional people—capable, dedicated and productive. They will maintain and enrich the civilian tradition of service characterized by the Revolutionary War rifle makers; the Citizen Scouts of the 1870's such as William Cody and Amos Chapman, both one-time holders of the Medal of Honor; and John C. Garand, developer of the M-1 rifle.

MODERN support for the modern Army is the objective of the civilian component. All Army civilian personnel programs are designed and constantly under review to contribute to the attainment of this objective. They are based on the same philosophies that govern industrial relations programs nationwide. They cannot afford to be second best, because the U. S. Army cannot afford second-best

Dressed in protective clothing, two scientists install equipment in a tank to determine how close the vehicle can approach atomic blast without danger to crew.

Employees at Fort Rucker install helicopter rocket mount that they themselves designed and developed.

administrative, technical, clerical or professional operations.

Civilian manpower is an expensive commodity. Employed in the quantity and quality levels needed by the modern Army, it represents a major budgetary item, just as it does in any enterprise. In return, the Army obtains the services of a diversified, highly skilled workforce. Not only does it perform jobs essential to the Army's missions, but it can also be a positive influence on the public image of the Army.

Because of its far-reaching impact on every aspect of Army operations, the retention of high quality civilian employees demands the best techniques available and the closest attention by all Army managers.

Of growing importance in many management functions is civilian handling of electronic data processing machines, such as this in The Adjutant General's Office.

Where there's boiling water, there's food, with

Quick-Serve Meals

RESULTS of a two-month test by troops of the 2d and 4th Infantry Divisions will serve as the basis for recommendations by the U. S. Army Infantry Board on the desirability of replacing present 5-in-1 rations with dehydrated meals.

The tests began in April, with the Infantry Board at Fort Benning, Georgia, designated as the principal coordinator of a consolidated Engineer/Service test of dehydrated, quick-service meals. Members of the Board and representatives of the Quartermaster Food & Container Institute and the Quartermaster Field Evaluation Agency will evaluate the practical aspects of feeding quick-serve meals to troops.

The quick-serve meal consists of pre-cooked dehydrated food products that require only addition of water in their preparation.

The tests were run off in two phases. Phase I was staged at Fort Benning when members of the 2d Battle Group, 1st Infantry, 2d Division, substituted the quick-serve meals for their normal rations. About 13,000 meals were used in this portion of the test.

Following this phase, an Infantry Board team proceeded to Fort Lewis, Washington, where one Battle Group of the 4th Infantry Division consumed some 45,000 meals during Exercise Lava Plains in May. At the same time, a different Battle Group used standard "B" rations to provide a basis for comparison.

THE meals under test presently combine into six-man and 25-man modules (or containers). One man can prepare breakfast, lunch or dinner for six, while with the 25-man module, two men can prepare a typical lunch consisting of chicken rice soup, meat and spaghetti with tomato sauce, butterscotch pudding, bread, jam, coconut bar and coffee, cream and sugar. All that is necessary is to boil water and follow simple instructions to prepare any one of 21 different test meals available.

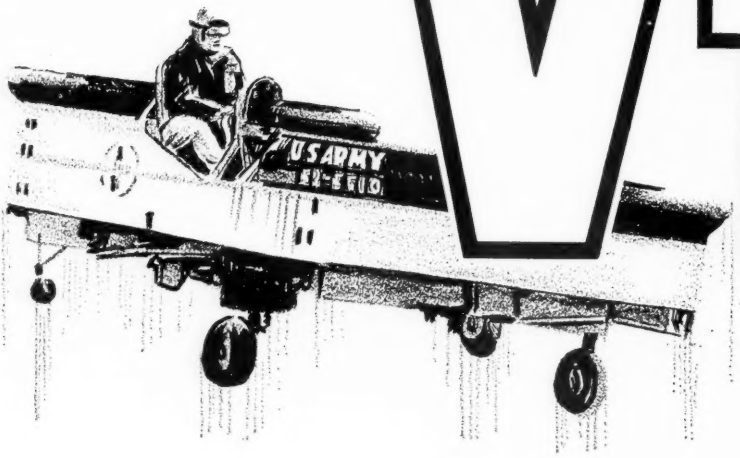
In the modules are packed not only the food but all necessary utensils for preparing and eating—paper trays and cups, plastic spoons, knives and ladles for mixing. All are disposable, thus eliminating necessity for dishwashing—a factor which helps offset the added water required to rehydrate the food.

THE meat and certain fruit and vegetable components of the quick serve meal are obtained by a new process in dehydration known as "freeze-drying." Food items that might be heat damaged or changed in structure during processing are frozen and then dehydrated under low vacuum pressure. Ice crystals that are formed are removed by "sublimation." In this process the crystals go directly from the frozen to the vapor stage without going through the liquid phase. The food item retains its original shape, and also rehydrates more quickly and completely than under previous methods. From 95 to 100 percent of the original flavor is retained, and food items such as a steak when reconstituted resume original shape and size.

The new process promises several other advantages—notably, reduction in weight. As an example, 80 pounds of cabbage are condensed into two and half pounds, in a container about the size of a flat can of tuna.

With the incredible now possible, Army Aviation planners face the question—

WHEN VTO



IN MAN'S attempts to develop flying machines, vertical take-off and landing (VTOL) has been particularly intriguing. Taking inspiration from the flight of birds where near vertical take-off and landing are common, many of the advanced thinkers of the past have devoted their talents to attaining VTOL flight. In the late 1400s Leonardo da Vinci designed a flying machine which, in the light of present knowledge, lacked only a lightweight power plant for successful flight. Da Vinci's design of an aerial screw was, in effect, a helicopter, and his theory of obtaining lift is quite similar to today's rotary-wing design theory.

In spite of this early start, several centuries passed before positive steps were taken toward successful vertical flight. Achievement of a reasonably light internal combustion engine was followed by the development of lifting rotors for Juan de la Cierva's autogiro and finally, in 1937, by the combination of the engine and rotors into the Focke-Achgelis FW-61 in Germany. Several years later came the development of the Sikorsky VS300 helicopter in America.

While the helicopter is a very successful VTOL machine that has become permanently established in short-haul transportation systems, it does have some serious limitations, such as a low top speed, limited range, and marginal all-weather

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TOL? AIRCRAFT

Thomas C. Muse *and*
Lieutenant Colonel William H. Brabson, Jr.

flight capabilities. As a result, it cannot be expected to satisfy VTOL requirements completely or to fulfill the early optimistic hopes of its strongest enthusiasts.

Just what should a VTOL airplane accomplish?

First, it is desired to get "there" from "here" and maybe come back to here. *Second,* this must be accomplished in all kinds of weather and in spite of natural terrain barriers. *Third,* the journey should be made as quickly as possible. *Fourth,* something useful must be achieved—perhaps carrying a payload in addition to the crew. *Fifth,* a minimum of external take-off and landing assistance or preparation is desired. And, *finally* all of this must be accomplished economically, quietly, safely.

Military Requirements

ALL three Military Services currently have requirements for VTOL aircraft of immediate as well as long-term interest, and all have supporting research and development programs directed toward achieving eventually an inventory of aircraft to meet these requirements. To simplify the picture, a large number of overall requirements for VTOL aircraft may be reduced to a reasonable number on the basis of the missions to be performed.

When VTOL Aircraft?

At present the military requirements for VTOL aircraft may be summarized as follows:

- ***Observation, surveillance and reconnaissance,*** including observation for command purposes, prestrike mapping and intelligence, poststrike damage assessments, and battlefield surveillance during an attack.
- ***Transport,*** consisting of intratheater transport of tactical forces, supply of combat forces and isolated bases, vertical assault by striking forces, and support of dispersed-site strike aircraft.
- ***Fighter-bomber or attack,*** dispersed-site aircraft that can perform the tactical air functions.
- ***Rescue and/or recovery*** of personnel or valuable lightweight equipment from open sea or inaccessible areas such as swamps or steep terrain.
- ***Search and early warning*** of both submarines and aircraft involving on-station hovering as well as tracking and killing functions.

A conventional fixed-wing aircraft does some of these missions very well. Its main forte is efficient, fast, horizontal flight. This is fine between terminals, but desirably it should also be able to take off and land vertically, particularly to minimize the investment at the terminals. Unfortunately, the conventional aircraft has no such ability.

The helicopter, however, is the master of up-and-down flight by virtue of its large, relatively slow-moving rotor, and the laws of physics which it capitalizes upon. Inasmuch as force is equal to mass times acceleration, for the hovering condition the amount of thrust (lift if directed vertically) is proportional both to the mass of air that is moved and to the speed with which it is moved. Thus a large mass of air can be moved slowly or a small mass can be moved fast and come out with the same result—except that the power consumed varies as the mass and the *square* of the speed. Because of a lack of power since the days of da Vinci, it has been more feasible to work with a large mass of air moving slowly; hence the helicopter configuration.

Main Configurations

SINCE the helicopter is the best "up-and-down" machine and the fixed-wing aircraft is the best horizontal-flight machine, a combination of the best features of each is the goal of VTOL research and development.

In general, there are four VTOL configurations:

- Dual propulsion;
- thrust tilting;
- thrust redirection;
- aircraft tilting.

Additional subtypes depend on the propulsion device utilized — such as rotors, propellers, ducted fans, or pure jets.

In the Department of Defense VTOL research program so far, it has been found that no one configuration has shown such superiority as to be accepted as the concept for all future designs.

Configurations which use rotors are more efficient than others for hovering; but, because the drag of such vehicles increases rapidly at higher speeds, tremendous power is required to increase speed to a top limit of something like 300 knots. Other configurations have more reasonable high-speed power requirements but use fuel at a fantastic rate during hovering or slow-speed flight. In other words, the technical feasibility of many of the designs has been established, as well as some trade-offs in performance. For the next step it seems appropriate to determine, from the operator's standpoint, the acceptability of the various compromises.

Feasibility Factors

THE future military use of VTOL aircraft will be influenced mainly by two factors:

- The degree to which take-off and landing sites will be restricted and ground preparation necessary.
- The higher cost of the VTOL aircraft compared to conventional airplanes.

The extent to which VTOL aircraft can operate from other than airfield sites is limited by the amount of ground preparation and logistic supply needed. None of the VTOL aircraft developed so far will be able to operate satisfactorily from the worst surface conditions—that is, areas of dry, loose earth, dry sand or gravel—without some form of surface stabilization. Short-term operation from firm sod, the best prepared surface, will probably be satisfactory for all VTOL vehicles except those using small, high-velocity streams of air, such as turbojet engines. Operational experience is necessary to determine practical limits for a military aircraft mission.

Cost and Economy

THE VTOL aircraft for most missions will cost more—both initially and for operations—than a conventional type; hence for a given budget fewer VTOL than conventional aircraft can be purchased. One of the main problems associated with this increased cost is complexity. Devices for directing the thrust downward to augment lift for the take-off and landing must also be capable of redirecting the thrust rearward for efficient cruising flight. Further, many configurations will require cross-connections, reduction gearing, rotors, propellers and the like, all of which add to the complications and cost.

The problem of mechanical complexity, and the difficulties of making inherently complex systems reliable and dependable are quite familiar. However, the attainment of reliability, along with light weight, is one of the most crucial problems in the development of VTOL aircraft.

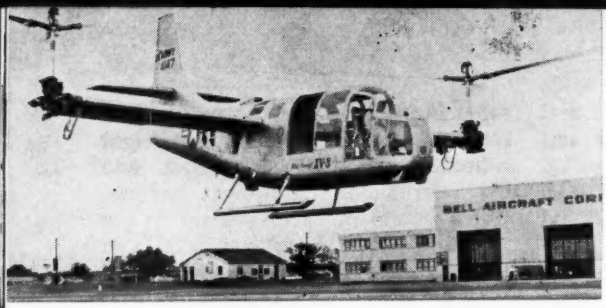
In regard to attaining light weight, some innovations will be required to reduce present structural weight ratios. There has been much ado over developing lightweight engines. But a pound of excess weight in the structure is just as crucial as it is in the engine. For every pound of weight added to a VTOL aircraft, it is necessary to add approximately 1¼ pounds of developed lifting thrust, since a margin of about 25-percent thrust is required over take-off weight under standard sea-level conditions to handle variations in temperature, altitude, and the abilities of individual pilots. This additional developed thrust does not take into account transmission and other mechanical and control losses that are generally rather substantial.

The structural weight of conventional aircraft has been reduced to a minimum consistent with safety, but before VTOL aircraft can become practical, ways will have to be devised for reducing structural weight even more.

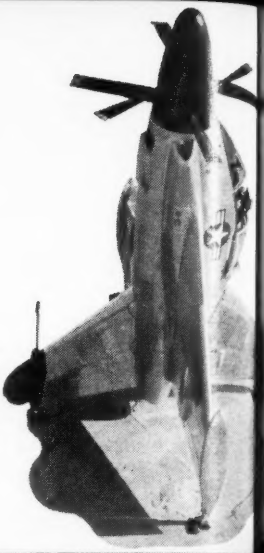
VTOL Test Aircraft

INVITATIONS to submit proposals for a small number of VTOL aircraft for operational suitability testing have gone out from the Bureau of Naval Weapons to 30 potential contractors. The program is being conducted by all three services to develop such a plane, with the Bureau acting as development agency for the project.

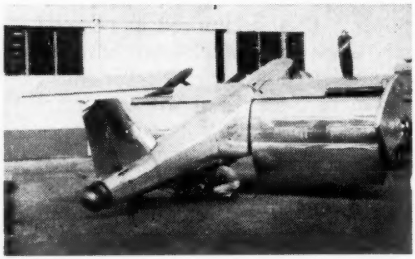
Major characteristics and performance goals are: operation from unprepared sites and amphibious assault ships with an 8,000 pound payload; maximum speed of 300-400 knots at sea level; cruise speed of 250-300 knots; and hovering capability of ten minutes. The project will be jointly and equally funded by the services over a four-year period. It is expected that the contractor will be selected by July.



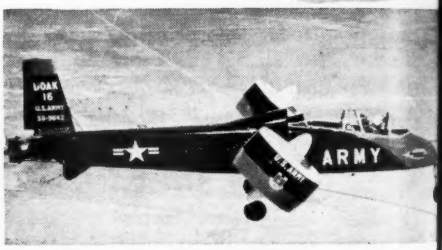
Bell XV-3 has tilting rotor, can carry 800 pound payload at 350 m.p.h.



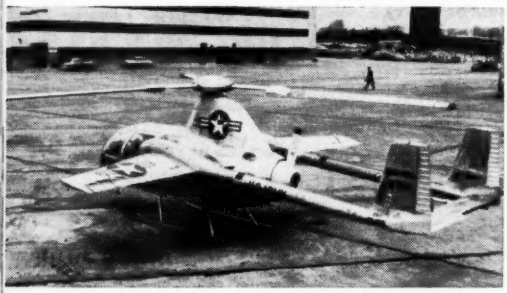
Convair XFY-1 delta-wing fighter flies at 650 m.p.h., takes off and lands in a sitting position. (U. S. Navy photo)



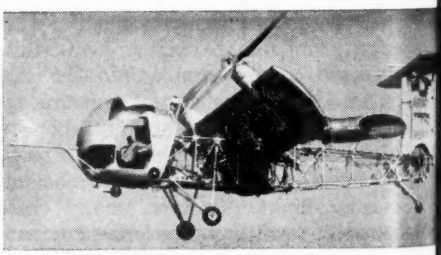
Ryan VZ-3 is deflected slipstream type, payload 470 pounds, speed 350-450 m.p.h.



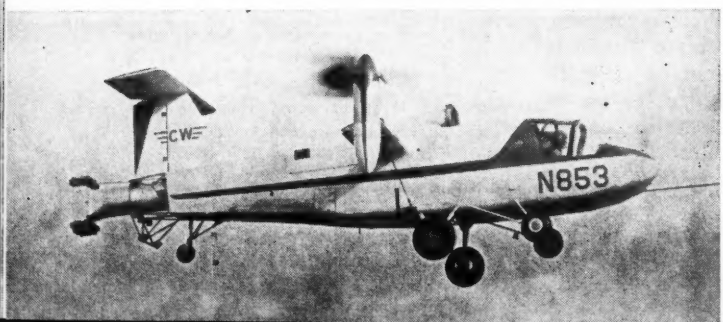
DOAK VZ-4, with double-ducted rotatable fans on wingtips, is tested.



McDonnell XV-1 is unloaded rotor, can carry 1,000 pounds at 200-300 m.p.h.

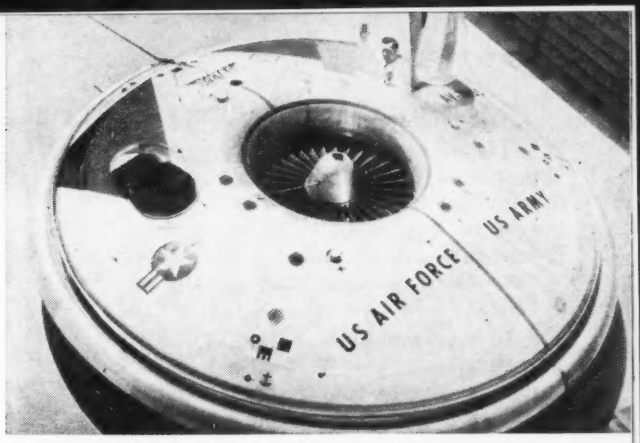


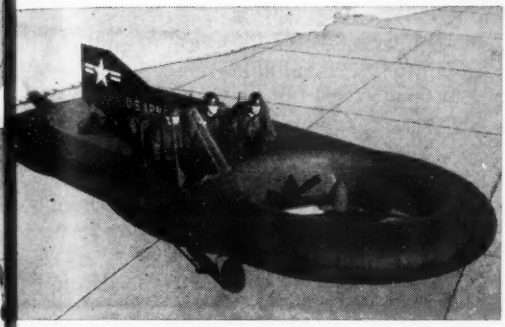
Vertol VZ-2 is tilt wing craft, payload about 470 pounds, speed 350-450 m.p.h.



Curtis-Wright X-100 is tilt prop craft, with payload of about 400 pounds, speed 350-450 m.p.h.

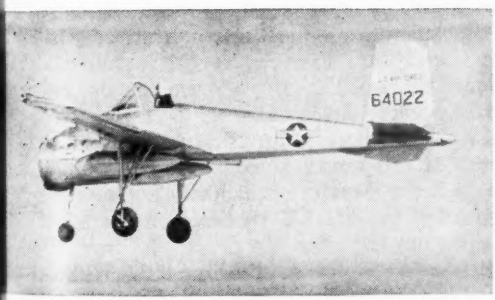
AVRO VZ-9 with turborotor annular jet duct is research craft for exploring new approach to VTOL. (U. S. Air Force photo)



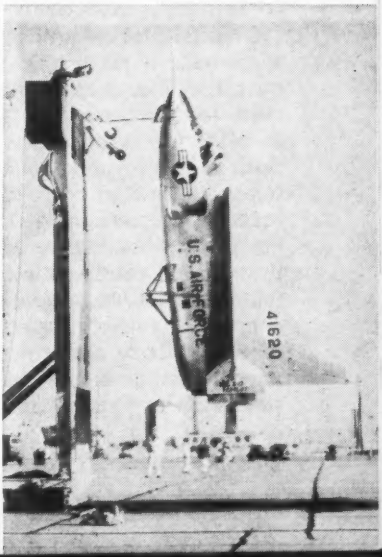


Piasecki VZ-8 is designed as light utility transport or observation platform.

Bell's ATV was rotating jet, an earlier research craft that was a forerunner to present X-14.



Bell X-14 is jet-propelled vertical-rising craft capable of supersonic speed. (U. S. Air Force photo)



Ryan X-13 Vertijet with 400-pound payload is designed for supersonic speeds. (U. S. Air Force photo)

Stability, Control, Handling

TO BE useful in all-weather conditions a VTOL aircraft must have stability, control and handling qualities at least equivalent to those of conventional aircraft, and for some missions these qualities must actually be better.

It has been found that VTOL aircraft systems can be designed to obtain a degree of positive stability by aerodynamic means but only with a penalty of additional weight and complexity. Automatic stabilization may also be used but, again, the required redundancy for all-weather flight results in weight penalties and increased complexity. Nevertheless, it is probable that black-box gadgetry will be required and in the end it will prove acceptable.

Major progress is being made to establish design criteria through evaluation of the current first generation of research vehicles correlated with results from corresponding tests on simulators. The bulk of this work is being done by the National Aeronautics and Space Administration.

Since all three Military Services presently have requirements for VTOL aircraft, a major forward step was taken last fall when the Services agreed to a specific tri-Service project to develop a 4-ton payload VTOL transport for operational evaluation tests.

This tri-Service project is expected to provide a reasonable start on the operational evaluation of VTOL aircraft for military use. It is planned to select from an industry competition a single, unspecified configuration designed to meet the performance requirements agreed upon by all Services; to build five prototypes of the selected configuration; and to use these aircraft with Service crews to conduct simulated missions for each of the Military Services. The industry competition is now under way and should be completed soon.

Other Efforts

THE tri-Service program is expected to be the major Department of Defense effort on VTOL aircraft over the next few years. This should not and will not be the only effort, however. From past programs, the understanding and knowledge of aeronautical fundamentals will permit construction of any of the several VTOL configurations already flown as part of the research aircraft program.

It is unlikely, however, that a single configuration will be satisfactory for all missions. For instance, a configuration most suitable for a transport probably will not be the most suitable one for reconnaissance. Therefore, it is expected that other programs, less sophisticated and more modest in scope, will be initiated on different configurations to parallel the tri-Service program.

Further, the engineer needs to know not only the best configuration for a given performance characteristic but what it will cost him to depart from that configuration in order to achieve the best balanced design.

In order to make optimum choices in compromises, he must have large quantities of accurate, correlated general data that can reveal to him the "trade-offs." In a number of important areas relating to VTOL aircraft, there is insufficient information of this kind. The Department of Defense therefore will likely be sponsoring general VTOL research for some time to come.

Where does all this lead? With a few VTOL prototype aircraft available in the field as a result of the tri-Service program, with possible improvements in powerplants, and with increased reliability of electronics devices for semiautomatic flight, progress in VTOL aircraft development will be seen during the 1960s. Operational VTOL aircraft, other than helicopters, are expected to enter the inventories of the military services in the late 1960s or early 1970s.

For the soldier—an opportunity to excel

For the commander—a management tool

The Army Enlisted Evaluation System

Major R. D. Tice

THE Army's rapid progress into the Atomic Age has brought with it a requirement for highly qualified personnel greater than ever before known or experienced in Army history. The modern Army demands the best people—those with the highest ability and qualifications—and its program to get and keep these people has been as much a part of its modernization effort as the introduction of new missile hardware.

As a specific means to this end, the Army has developed its Enlisted Management Program to encourage the individual soldier to improve his performance progressively while providing him with the opportunity to advance. At the heart of this program is the Enlisted Evaluation System, the "new look" feature of Army personnel management.

Origins of System

AS far back as 1948, the Army recognized the need to identify and develop adequate numbers of highly qualified career personnel. It also recognized that these careerists should be provided with an opportunity to demonstrate their abilities through means other than human observation. A system of objective evaluation by examination was indicated as a necessary supplement.

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First step in this direction was the introduction of the Army's Career Guidance Program in 1948. This program identified by military occupation the career fields in which qualification for advancement was determined by written examination and a job performance rating.

The program was discontinued during the Korean War because of its inability to adapt to periods of mobilization. Notwithstanding its shortcomings, the Career Guidance Program did much to establish the need for an Army-wide evaluation system and provided the basis for continued study into this particular facet of personnel management.

After the Korean conflict, the Army recognized an increased need for a more definitive tool to measure

the individual soldier's capabilities in light of rapidly changing Army-wide personnel requirements. Moreover, there was an ever increasing demand for the highly skilled and competent career soldier to support the Army's modernization program.

In early 1956, a detailed study was initiated to develop a more objective means for measuring individual proficiency. Opinions of field commanders at each echelon were solicited. High on the list of their recommendations was an Army-wide proficiency testing program.

Concurrently, an NCO symposium recommended the adoption of a promotion system for enlisted personnel based on centralized testing.

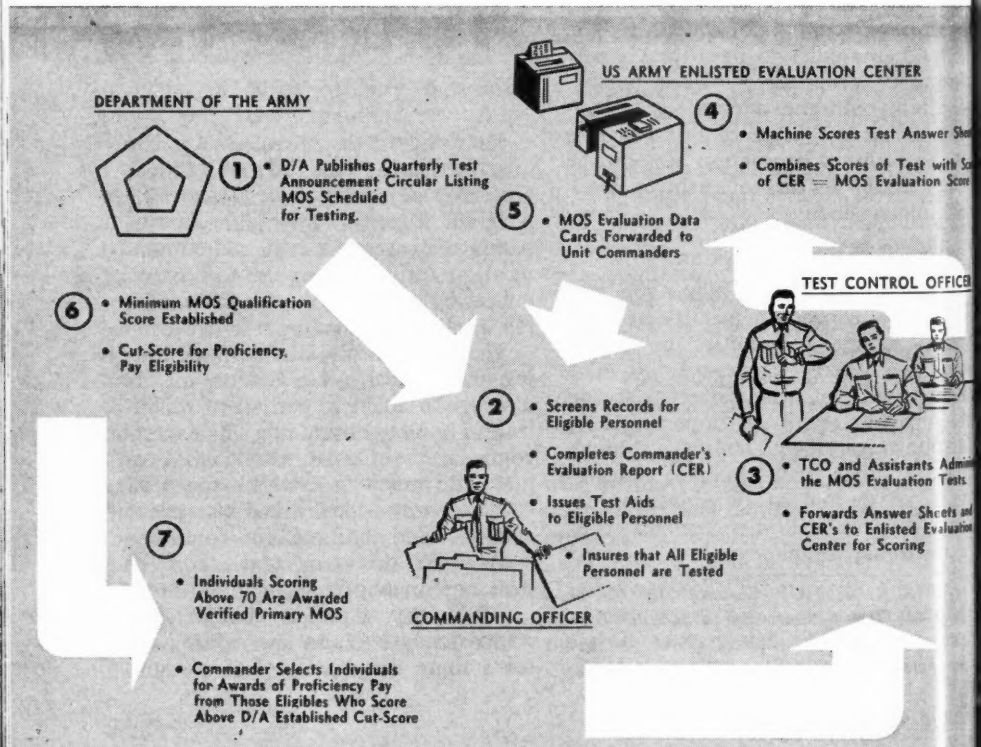
In addition, an Army-wide opinion survey was conducted to determine what type of evaluation system would be considered most equitable by enlisted personnel. The results showed more than 70 percent of the enlisted personnel surveyed favored some form of competitive Army-wide tests.

Another factor was the report of the Cordiner Committee which indicated that an objective means for determining eligibility for promotion and for the award of proficiency pay was necessary to insure retention of the most highly qualified personnel.

From these facts, experiences, opinions, and suggestions, the Army developed its evaluation system. This system was designed to measure objectively the job proficiency of each individual soldier and compare this with Army-wide standards.

The system, in its final form, was developed specifically to —

- Provide a competitive challenge and a sense of accomplishment for the soldier examined.
- Require a minimum of administrative effort on the part of unit commanders, and
- Insure retention of traditional command prerogatives and responsibilities.


US ARMY ENLISTED EVALUATION CENTER
DEPARTMENT OF THE ARMY
1 • D/A Publishes Quarterly Test Announcement Circular Listing MOS Scheduled for Testing.
4 • Machine Scores Test Answer Sh
• Combines Scores of Test with Sc of CER = MOS Evaluation Score
5 • MOS Evaluation Data Cards Forwarded to Unit Commanders
TEST CONTROL OFFICER
6 • Minimum MOS Qualification Score Established
• Cut-Score for Proficiency Pay Eligibility
2 • Screens Records for Eligible Personnel
• Completes Commander's Evaluation Report (CER)
• Issues Test Aids to Eligible Personnel
• Insures that All Eligible Personnel are Tested
3 • TCO and Assistants Admin the MOS Evaluation Tests
• Forwards Answer Sheets and CER's to Enlisted Evaluation Center for Scoring
7 • Individuals Scoring Above 70 Are Awarded Verified Primary MOS
COMMANDING OFFICER
• Commander Selects Individuals for Awards of Proficiency Pay from Those Eligibles Who Score Above D/A Established Cut-Score

HOW THE ENLISTED EVALUATION SYSTEM WORKS

From Distribution Section of Enlisted Evaluation Center, tests are sent out to be administered to U. S. Army personnel serving around the world.

In September 1958, the system was formally announced by the Army and officially identified as the Enlisted Evaluation System. As currently implemented, the system provides for an annual evaluation of all soldiers in pay grade E-4 or higher in his or her primary Military Occupational Specialty (MOS). This evaluation is obtained from the results of an MOS Evaluation Test and a Commander's Evaluation Report (CER). In certain MOS, where precise performance standards have been established as a basic requirement for award of the MOS, Performance Tests are used as an additional measuring instrument. (See "Advancement in the Army," February 1959 DIGEST.)

MOS Test

THE MOS Evaluation Tests are primarily objective written tests designed to cover the essential knowledge required at a specific level of skill. All soldiers holding the same primary MOS, regardless of where stationed, are presented with the same set of job problems to solve. Each question has four possible answers or solutions.

MOS tests for specialists contain 100 questions, all technical in nature. Those for noncommissioned officers contain 125 questions, including in addition to technical items questions which measure knowledge of supervisory ability, training methods, how to motivate subordinates and some aspects of human relations.

MOS tests for NCOs in pay grades E-8 and E-9 also include items which measure ability to learn rapidly, to think clearly and effectively and to exercise sound judgment. These additional items have been developed in view of the special prerequisites established for the Army's "super grades."

All MOS test questions are job-oriented and are designed to measure job understanding rather than general knowledge. Where appropriate, maximum use is made of schematic diagrams and illustrations, and every effort is made to avoid the require-

ment for rote memory and academic detail.

Special emphasis is continually given to test improvement. After the tests have been scored, each test is analyzed and appropriate revisions are made before it is administered again. The revision not only includes reliability and validation analyses, but also updates the subject matter content—a factor extremely important in view of the continual introduction of new items of Army equipment as well as changes in tactics and doctrine.

The MOS tests are developed through cooperative efforts of personnel at the U.S. Army Enlisted Evaluation Center, MOS monitors, and MOS subject matter specialists located at the various Army Service Schools throughout the United States. The base point for the development of a test is the job specification contained in the manuals of enlisted MOS. A separate test is developed for each level of skill within an MOS. This provides a "built-in" element of fairness, insuring that individuals are evaluated with their contemporaries.

In addition, every possible effort is made to guarantee the security of test content; it commences with the development of the test outline and does not end until the test is finally destroyed.

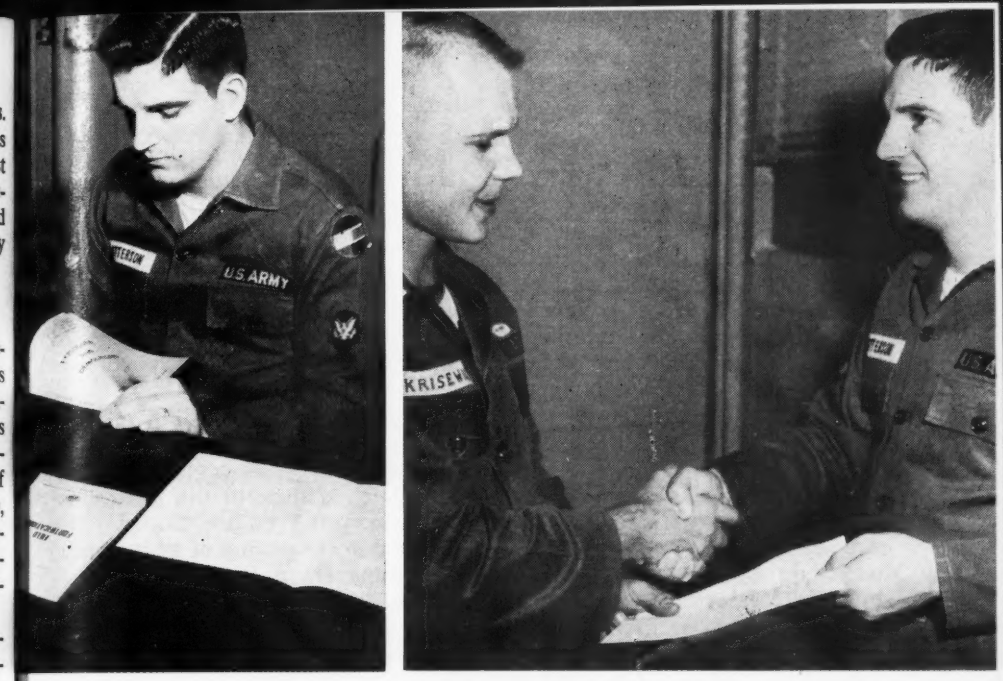
Commander's Evaluation Report

THE Commander's Evaluation Report, more often called the CER, is a performance rating form. It includes a series of ten rating scales which list specific individual traits—such as initiative, comprehension of instructions, persistence, motivation, cooperativeness, leadership, and promotion potential—which are not properly suited for measurement by written tests.

The rating is completed by the individual's immediate superior, or supervisor, and is endorsed by an officer or warrant officer. It also includes space for the unit commander to enter his recommendations concerning the individual.

This rating form is designed to

After tests have been taken, master score cards are sorted by machine before reports are prepared announcing individual MOS evaluation scores.



After studying at Fort Benning, left, Sp4 James H. Patterson passed test and was awarded proficiency pay by executive officer, Lt. J. M. Krisewicz.

yield a numerical score which, when combined with an MOS test score, comprises the MOS Evaluation Score furnished each examinee and his commander.

Test Aid

TO ASSIST the individual in his preparations, an MOS Test Aid is furnished to all eligibles, approximately 90 days prior to the scheduled testing session. These aids are developed by the same people who prepare the tests. Generally, the aid provides instructions on how to prepare to take the test and lists all appropriate references relating to a specific level of skill within a given MOS.

How the System Operates

FOCAL POINT for administration of the system is the U. S. Army Enlisted Evaluation Center at Fort Benjamin Harrison, Indiana. Operating under The Adjutant General, the Center is responsible for the technical and administrative aspects, including test and test aid development, printing, storing and distribution of the tests and supporting material. It also scores evaluation instruments and reports results to the field.

Periodically, Department of the Army announces an MOS testing schedule, usually about five to six months before tests are administered. The schedule, released by Department of the Army circular, contains eligibility requirements and lists the MOS to be evaluated during a particular session. Testing sessions are programmed for the second month of each quarter—*i.e.*, August, November, February and May of each year.

This announcement triggers specific administrative actions. First, the unit commander directs screening of his unit records for eligible personnel and completes a CER for each. Next, the completed CERs are forwarded to a Test Control Officer who requisitions test booklets and answer sheets from the U.S. Army Enlisted Evaluation Center. On a selected

date, the Test Control Officer and his assistants administer the tests.

Test answer sheets and CERs are then sent to the Center for machine scoring. An MOS Evaluation Score is established by combining results of the written test with the CER. These MOS Evaluation Scores are then returned to the unit for recording on individual personnel records. The results are used as the basis for personnel actions where Army-wide standards of proficiency are useful.

Proficiency Pay Program

TO DATE, two separate programs have been applied to the Enlisted Evaluation System—Proficiency Pay and MOS Classification.

In the area of proficiency pay, initial testing began in January 1959 when over 16,000 soldiers were evaluated in the Army's most critical MOS to determine their eligibility for the award of such pay. (See "Proficiency Pays Off," October 1959 DIGEST.)

Subsequent to this initial application of the evaluation system, new MOS tests have been developed and phased into the system to meet the requirements of the Proficiency Pay Program. By the end of Fiscal Year 1962, every MOS requiring skills above the helper level will have been initially evaluated. Full implementation of the system spans a period of approximately four years. This time frame is more understandable when one considers that approximately 1,300 separate MOS tests are required.

For proficiency pay purposes the evaluation system is used primarily as the objective means to establish the relative proficiency of individuals based on Army-wide standards. A relative ranking is established which identifies those individuals who are "best qualified." These become eligible for the award of proficiency pay.

Although Department of the Army establishes the cut scores and thereby determines eligibility for award of the pay, the final authority for making the award rests with the unit commander. Thus, as originally intended, the basic responsibilities and prerogatives of command are retained.

Verification of Primary MOS

ALTHOUGH initially geared to proficiency pay requirements, effective with the February 1961 testing session the Enlisted Evaluation System was expanded to the area of MOS classification. For the first time, relative ranking was not the sole criterion, and a pass or fail score was established in addition to the relative results indicated by the scores. This marked the beginning of a program to determine if an individual is qualified in his primary MOS.

Under this program, enlisted personnel must qualify for their primary MOS by attaining at least a minimum MOS qualification score. Each individual who scores above the minimum has his primary MOS designated as his Verified Primary MOS.

For those who fail to qualify, the commander can take one of several actions—he may give the soldier additional training in his current MOS; he may reclassify him to a lower skill level within the same MOS; or he may retrain the soldier and reclassify him in a new MOS.

As a personnel management tool, this program provides a basis for command action to insure the retention of only qualified personnel in a given skill. On the other hand, it has identified the best qualified for selective personnel actions.

Opportunity

ALTHOUGH the Army's evaluation system is new, it is proving to be an effective personnel management tool. It has been applied successfully to two different enlisted management programs—one to identify the best qualified soldiers and, more recently, to isolate those who are not qualified or who are improperly classified. In the near future, it will be expanded to

the area of enlisted promotions. Other programs, where Army-wide selective personnel actions are warranted, will find the Enlisted Evaluation System a ready-made tool.

Through the working of the Army's evaluation system the individual soldier is now provided with the means to demonstrate to his superiors, to his contemporaries and to his own personal satisfaction that he is, in fact, highly qualified to perform the duties required of him. This, combined with monetary compensation earned through Army-wide competition, provides a true incentive to excel.

Electronic processing is linked with advanced techniques of personnel management in the Army's

By-Name Assignment Program

Colonel Walter H. Grant

FAR REACHING changes in military requirements have led to the development of an entirely new program in Army enlisted assignment procedures. Known as the By-Name Assignment Program, the new system was initiated in 1958 and is scheduled for completion in June of this year. Its purpose is threefold—to benefit the individual soldier, to modernize manpower management functions, and to improve the Army's readiness.

The size of the peacetime Army and the multiplicity of its missions and tasks have complicated the job of personnel and manpower management. Putting the right man in the job has always been the aim, but there are many considerations requiring attention before the right man is chosen for the job.

For example, commanders request assignment of enlisted personnel by grade and MOS. This simple requirement would not pose too much of an assignment problem if the Army's inventory of personnel always matched requirements exactly by grade and MOS. Unfortunately, they do not.

Even so, the grade and MOS requirement, by itself, is not overly restrictive. Consider for a moment some of the other factors—long and short tours overseas, availability of family housing (even in long tour areas), security clearances, retainability of the individual in the service, restrictions on permanent change of station moves, stabilization policies in continental United States (CONUS), medical restrictions, enlistment commitments, special qualifications such as language fluency, proficiency pay and many others.

For example, an overseas-duty qualified NCO who last served overseas in Korea, who speaks a foreign language fluently and who is proficiency pay qualified, cannot be

COLONEL WALTER H. GRANT, General Staff, is Chief, Distribution Division in the Office of the Deputy Chief of Staff for Personnel, Department of the Army.

assigned without due regard to all of his qualifications. In his next overseas assignment he should go to a long-tour area and be assigned in his proficiency pay MOS. Yet during the month in which he is to be reassigned there may be only one job in the entire Army which will satisfy these requirements. All such factors are considered at Department of the Army level in selecting personnel for assignment.

Improved Procedures

THE growing technology of the modern Army and the requirement for a replacement system responsive to both peacetime and wartime needs, generated a demand for these new assignment techniques. Use of air transportation and the advent of machine data and electronic data processing also provided means to improve and accelerate assignment processing. Furthermore, some loss of control of manpower management had resulted from the decentralized system used in the past. The By-Name Assignment Program capitalizes on new techniques and seeks to correct old deficiencies.

The new procedures represent a significant Army "breakthrough" in both personnel and manpower management. Heretofore, assignment, reassignment and accounting for military personnel were manual operations. The Department of the Army normally issued instructions to major commands directing bulk reassignment by number, grade and MOS. The large numbers of persons reassigned each month made such manual operations cumbersome and slow, hampering responsiveness to the changing needs of the Army.

Under the new By-Name Assignment Program, it is now possible each month to come up with rapid computations which permit accurate assignment of military personnel in accordance with their skills and command requirements.

In October 1958 by-name assignment of enlisted personnel was applied for all new accessions into advanced individual training. This was made possible through mechanical processing of personnel data relating to non-prior-service enlistees. With the advent of the E-8 and E-9 program, those at the other end of the enlisted grade scale were also assigned by Department of the Army on a by-name basis.

In another phase which began in November 1960, all enlisted men returning from overseas for reassignment began to receive orders based on instructions issued by The Adjutant General, Department of the Army, in Washington. Also at that time, by-name assignments made in Washington began for CONUS enlisted men in grades E-7 through E-1 placed on levy for overseas service during February 1961 and thereafter.

The next step was to make by-name assignments in Washington for personnel completing advanced individual training. This phase was implemented in March 1961.

Personnel Management Features

WHILE the By-Name Assignment Program was designed primarily to centralize control of enlisted personnel resources, to improve their utilization and to assist in the continued automation of the U. S. Army Replacement System, it was also tailored to include desirable personnel management techniques throughout. Some of these features include:

► Increased opportunity to compete for available promotions by permitting an enlisted man to perform duty in his additional skills if his primary skill is surplus.

► Earlier notification of assignments for enlisted personnel.

► Increased opportunity for an enlisted man to move out of a surplus skill area by providing available Army assignments which use his added skills.

► Increased equality in selection for overseas tours by Army-wide consideration of eligibility for such duty.

► Increased opportunity for an enlisted man to voice preference for location of his assignment.

In the latter connection, final assignment will always be governed by the needs of the service, but increased opportunity for voicing preferences and increased attention to indicated preferences are part of the by-name program. For example, men returning from overseas are asked to indicate their preference of area of assignment, and CONUS is divided into thirty-five areas for this purpose. But does the Department of the Army pay attention to these preferences? The record indicates that it does.

Forty percent of the men returning from overseas in the months of March, April and May 1961 will have an assignment in their exact area of preference. Another group representing over twenty percent of all af those returning have received an assignment to an area immediately adjacent to that of their first choice.

None of the existing features of personnel management in the Army have had to be sacrificed in order to achieve the above improvements.

Impact at Company Level

TO THE company commander in continental United States, it may appear that he has lost a significant part of the control over personnel management in his company. But such is not the case.

Under the new system, the CONUS company commander can be certain that his unit will not be alone in bearing the burden of overseas levies. Department of the Army will be reassigning "homesteaders" no matter where found—company, staff, depot or higher headquarters. In the long run, the company and battery will benefit from this policy; longer average CONUS tours for personnel at unit level should result when all enlisted men share overseas assignments.

Company commanders and section chiefs in CONUS can avoid the damaging loss of key individuals by careful attention to the overseas eligibility of their enlisted personnel. CONUS stabilization of eighteen months is the minimum. Therefore, as a key individual approaches the end of his eighteen months CONUS stabilization, it is time to provide an understudy for him.

Department of the Army is appreciative of the personnel problems of the company battery commanders and is working through personnel channels to give assistance where possible. Unit personnel officers can further aid unit commanders and section chiefs by giving timely warning as personnel become vulnerable for overseas assignment.

There may be times when operational requirements would justify a temporary deferment of an overseas-eligible and qualified soldier. Department of the Army accepts requests from commanders in such cases, and each is considered on its own merits.

These improvements in the assignment process are not the ultimate goal in the replacement system. They represent the first major steps toward complete automation. As equipment becomes available, punched card operations will be converted to magnetic tape process. Eventually, suitable electronic means will link the system, providing instantaneous reaction to the replacement needs of the Army.

THE By-Name Assignment Program thus marks a significant advance in the technique of military manpower and personnel management. Through the use of electric accounting machines, personnel processing is accelerated, greater attention is paid to equity in assignments, greater accuracy is attained, and much more efficient use is made of the Army manpower pool.

NEWS of professional interest

Guard Converts to Nike

Conversion from guns to missiles for Army National Guard antiaircraft batteries on 24-hour alert as part of the active Army Air Defense Command has been completed, with a total of 82 batteries now on-site defending the country's major population areas. A total of 76 Nike-Ajax batteries are operational in continental United States; in addition, there are six Nike-Hercules missile batteries in Hawaii.

Special Forces Guardsmen

A total of 80 Special Forces Detachments have been incorporated in the Army National Guard's military structure since 1959. Small, elite groups of highly-skilled specialists, they are training to operate in the homeland of any future enemy, learning how to organize sympathetic partisans into guerrilla units and then train them to strike in the rear of enemy lines. So far, five States have taken over the task of training these new detachments—Alabama, Louisiana, North Carolina, Utah and West Virginia. Training is conducted on weekends and during multiple drills; some units spend weekends training in wilderness areas.

Turbine Engine Development

Development of a 600 horsepower gas turbine engine for marine and vehicular applications will be carried on by the Ford Motor Company and the Solar Aircraft Company, San Diego, California. Each has received a contract for the joint Army-Navy development of such an engine. Objective is to develop a gas turbine having a fuel consumption comparable to diesel engines and better than gasoline engines.

Titanium Rocket Case

Called a major advance in missile technology, the U.S. Army Ordnance Missile Command has announced successful static firing of an improved high energy, solid propellant rocket motor using a lightweight, high-strength motor case made of titanium. The titanium case is about 30 percent lighter than steel ones now in use, making the motor "the highest performance, full size, metallic propulsion unit, pound for pound, ever successfully fired in the United States." Titanium not only is light in weight but is extremely durable. Research into its use was pioneered by the Army, with research into possible application in rocket motor cases undertaken by Pratt and Whitney Aircraft Company in January 1959.

Caribou in Production

Contract has been awarded to DeHavilland Aircraft of Canada, Ltd., for production of AC-1 "Caribou" transport aircraft for the Army. The Caribou is largest of the Army's fixed-wing aircraft, grossing 26,000 pounds and capable of carrying 32 passengers or 24 troops or 14 litters and eight troops. Range is 850 nautical miles.

Shillelagh Contract

Work on the Shillelagh missile will continue under a $5,361,619 contract awarded by the Army to Ford Motor Company's Aeronutronic Division, Newport Beach, California. The Shillelagh is a surface to-surface anti-tank guided missile designed for close-in support of front-line troops. It also can be used against field fortifications.

Medical Research Unit

A new medical research unit, the SEATO Medical Research Laboratory, has been established in Bangkok, Thailand, in collaboration with the Army Medical Service. The laboratory will conduct continuing research in infectious diseases including cholera, typhoid, hookworm disease, dengue fever, malaria, filariasis, scrub typhus. The U. S. Component has been established as a special activity of the Walter Reed Army Institute of Research, and will eventually consist of about 15 scientific and medical personnel.

Chemical Warfare History

The story of "The Chemical Warfare Service: From Laboratory to Field" comprises the fifty-first volume published in the series, United States Army in World War II. It is the second volume in the Chemical Corps group in the subseries The Technical Services.

Authors of the volume newly published by Office of the Chief of Military History are Dr. Leo P. Brophy, now chief of the Chemical Corps Historical Office; Dr. Wyndham D. Miles, staff member in the same office; and Dr. Rexmond C. Cochrane, research associate in the Department of History, University of Maryland. The 498-page book is sold for $3.50 by the Superintendent of Documents, Government Printing Office, Washington, D.C.

Military Construction

Consolidation of responsibility for military construction in 17 of the 42 Army Engineer districts has been announced by the Department of Defense. Reassignment of work loads will reduce administrative costs and permit more effective use of administrative support facilities and staffs, and professional engineering talent. Under the new program, no district offices will be closed although the Washington District is to become an area office of the Baltimore District.

Additional Hawk Units

Activation of two additional Hawk surface-to-air missile battalions brought to 13 the number of such units in the Army. Activated at Fort Bliss, Texas, were the 8th Missile Battalion, 15th Artillery in April and the 6th Missile Battalion, 62d Artillery in May.

Two additional Hawk units—the 6th Missile Battalion, 52d Artillery and the 6th Missile Battalion, 59th Artillery—are being sent to Europe.

Hawk now has been accepted as a

For U. S. Army Command and General Staff College Graduates —

Refresher Courses

A SPECIAL extension graduate refresher course has been announced by the U. S. Army Command and General Staff College, Fort Leavenworth, Kansas, to bring graduates up to date on significant doctrinal and procedural changes occurring annually in the College's resident associate course.

Subjects include role of the Army, fundamentals of combat, and Aggressor doctrine; technical, tactical and logistical considerations for nuclear weapons employment; and general staff procedures. Graduates may enroll by writing to the Department of Nonresident Instruction, U. S. Army Command and General Staff College.

A POCKET FORM brief entitled "Summary of Nuclear Weapons Employment Changes" has been prepared by the U. S. Army Command and General Staff College for distribution to graduates of the Senior Officers Nuclear Weapons Employment Course (SONWEC). Graduates may obtain a copy by written request to the Commandant, U. S. Army Command and General Staff College, Fort Leavenworth, Kansas, ATTN: Secretary.

Because the pocket brief is classified Secret, each applicant must include a statement that facilities are available for receipt, storage and safeguarding of such documents.

NATO weapon and will be produced in quantity in Europe by Belgium, France, Federal Republic of Germany, Italy and the Netherlands. The missile was developed for the Army by Raytheon Company, Lexington, Massachusetts.

Guided Missile Systems Course

A Guided Missile Systems Officer Course is being offered by the Army Air Defense School, Fort Bliss, Texas, to provide an advanced comprehensive course in guided missile systems and related physical sciences. Any arm or branch having a requirement for missile systems or similarly qualified officers may utilize the course.

The course runs for 38 weeks, with about a third of the work being practical in nature in electronics laboratories and on missile systems such as Hercules and Hawk. Field trips are arranged to White Sands Missile Range, Holloman Air Force Base and selected West Coast research, development and production agencies. No entrance examination is required, and graduates are awarded MOS 1181.

Applicants must be 1st Lieutenant or higher, and have completed a college course in integral and differential calculus, plus one semester of college physics. A security clearance of Secret (Interim) is required. Applicants may fill out local army form 254, or equivalent, and submit it to their personnel officer.

Electronic Checkout

A concept envisioning use of strategically placed sensors to forecast electronically the condition of various aircraft components is being tested. Known as Project Alarm, for Automatic Light Aircraft Readiness Monitor, it would save man-hours in carrying out maintenance inspections on Army aircraft. Research into feasibility of the concept is being carried out by Bendix Corporation, York, Pennsylvania, under a contract with the U. S. Army Transportation Research Command.

Nike On-Site Firings

Nike units in Alaska who fire the Nike-Hercules from their operational sites are among the few in the world who do not return to Fort Bliss for actual firing. During Fiscal Year 1960 all the Alaska Nike-Hercules batteries fired from a location near Eielson Air Force Base, while in Fiscal Year 1961 batteries of the 4th Missile Battalion, 43d Artillery, fired from the Chugach Mountains. Because the firings were so close to the metropolitan area of Anchorage, many Alaskan homesteaders voluntarily evacuated their homes during the period so that range safety measures could be met.

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The Ground COMBAT SOLDIER

THE paramount concern of the Army is the ground combat soldier. He is the focal point of all our efforts. Organizing, equipping, training, sustaining and supporting him so that he can perform his indispensable role in combat is the Army role.

This role is equally significant in any kind of war—hot or cold. It is just as important in general war as it is in limited war. For our Nation to entertain any notion to the contrary would be dangerous.

The danger could be social as well as military. More than any other category of personnel in the Armed Forces, the ground combat soldier comes from the general populace. He is the private citizen under arms—the clenched fist of his people.

It is by no idle chance in the history of mankind that the course of democracy parallels the importance accorded the ground combat soldier in the military forces of nations. It is no exaggeration to say that the basic freedoms we now enjoy are closely related to his ascending importance on the battlefield since the Battle of Crecy. Nor is it an exaggeration, in my opinion, to say that the preservation of those freedoms will continue to be oriented by his place in the sun.

Only when men from all of the people are willing and ready to fight and die for freedom does freedom have meaning for them. Only then does democracy thrive. That is the inexorable lesson of history.

Beguiled by the mechanical marvels of our age, it is easy for people to forget the true character of the ground combat soldier's role in war. When free men have been so beguiled in the past, they have slipped back into vassalage. For the ability of the ground combat soldier to play his part in the social scheme of things depends upon the part he is given in the military scheme of things.

It will be a sorry day for all mankind in this supersonic nuclear age of ours should the ground combat soldier ever be deprived of his rightful place in the hearts and minds and military forces of his people.

In our efforts to avert this danger, a One-Army attitude must pervade all ranks. The ground combat soldier is not a guardsman, nor a Regular, nor a reservist, nor a selectee. He is simply the American fighting man on the One-Army team. I appeal to every member of the team—civilian and military—to give his cause the enthusiastic support merited by its vital importance to our country.

Bruce C. Clarke

BRUCE C. CLARKE
Commanding General,
United States Army Europe

SOLDIER

THIS IS WHY YOU ARE IN USAREUR

- TO PLAY YOUR PART ON THE NATO TEAM
- TO HELP MAINTAIN THE PEACE BY BEING CONSTANTLY COMBAT READY
- TO BE A GOOD NEIGHBOR TO OUR NATO NEIGHBORS
- TO FIGHT, IF NECESSARY, FOR THE RIGHTS OF FREE MEN IN A FREE WORLD